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ABSTRACT

This curriculum module is designed to provide teachers with classroom activities that promote an understanding of environmental issues such as conservation, preservation, ecology, resource management, solid waste management, and recycling. The activities enable teachers, students in grades 4 through 8, and families to begin thinking about these issues in relationship to their own lives. The activities are designed to give children a sense of their own power, to bring about change, and to give teachers flexibility to modify, adjust, and fit the activities into existing social studies, mathematics, science, fine arts, health, and language arts curricula. The unit has been correlated to the Indiana Curriculum Proficiency Guide and each level in the unit is a foundation for the next with responsibility, citizenship, stewardship, and environmental issues addressed at each level. Names and addresses of several organizations related to litter, recycling, and waste management are included. Contains 16 references. (DDR)

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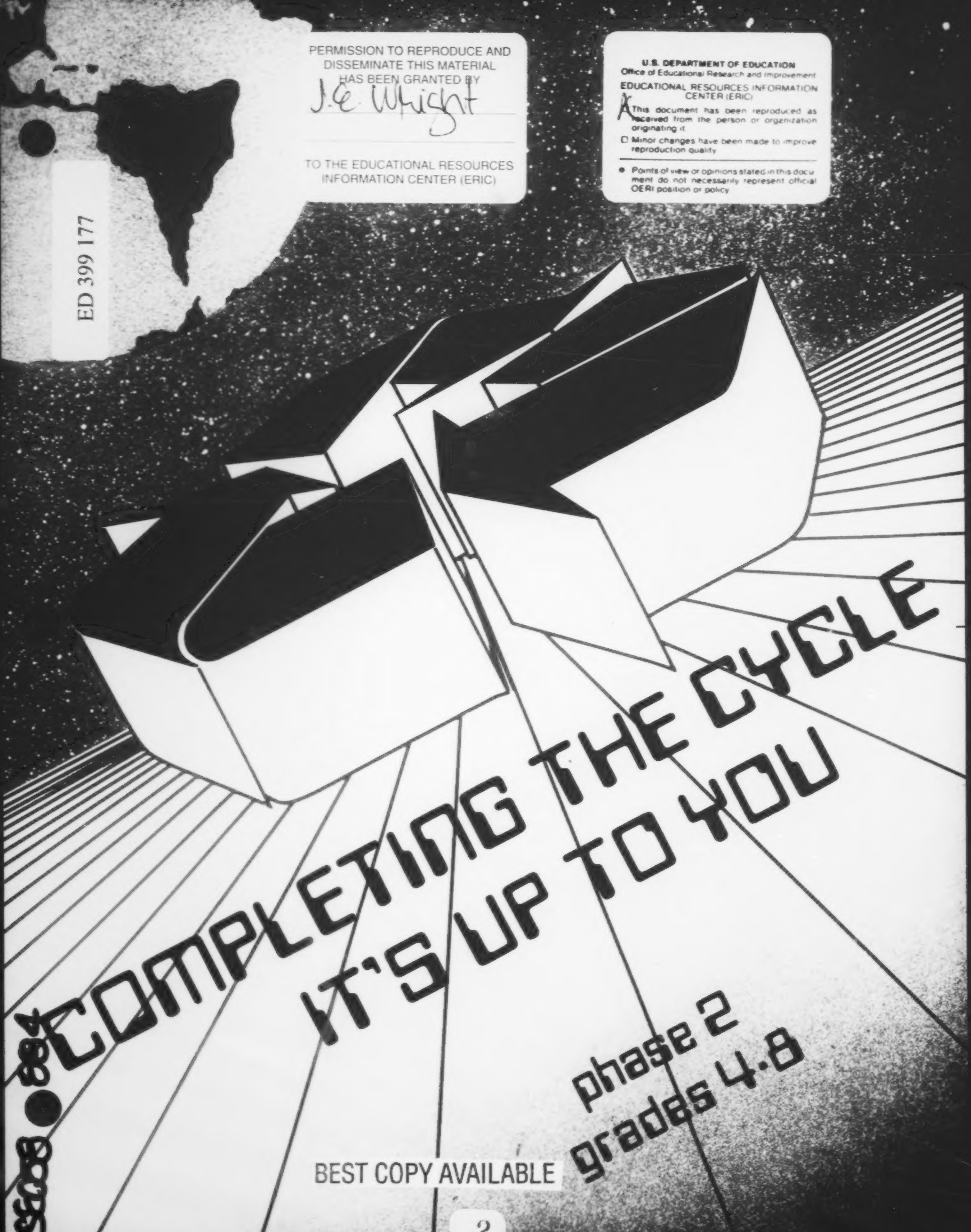

COMPLETING THE CYCLE
IT'S UP TO YOU

phase 2
grades 4-8

SE 058 884

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Completing the Cycle – It's Up To You

Responsibility for the Environment

Phase 2

An Integrated Unit in Environmental Education
Grades 4 - 8

Indiana Department of Education
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798
(317) 232-9141

1993

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Message from the Superintendent

Dear Indiana Educators:

The module, "Completing the Cycle – It's Up to Me," for Kindergarten through Grade 3 students addressed the problems of vanishing or depleting resources in our land. Teachers were extremely supportive of this program and have made excellent use of that module.

This second unit in the program, "Completing the Cycle – It's Up to You," expands on that theme with lessons and activities for Grades 4 through 8. In it, we integrate important environmental knowledge into the disciplines of fine arts, health, language arts, mathematics, science, and social studies.

As you work with these lessons, we encourage you to develop new activities and to submit the most successful of those to the Department of Education for networking with other Indiana schools.

We believe you, your students, and our environment will all benefit from the use of these important activities.

Sincerely,

Dr. Suellen Reed

Dr. Suellen Reed
Superintendent of
Public Instruction

Message from the Indiana Soft Drink Association

The Indiana Department of Education, School Assistance Unit, wishes to communicate its appreciation to the Indiana Soft Drink Association for providing the funds to develop and print this publication.

The Indiana Soft Drink Association adds the following:

Education is the key to successful solid waste reduction and recycling programs. And, the best place to start is in the classroom. By supporting and promoting waste education programs, you can help provide a crucial communications link among students, teachers, families, and your community.

The soft drink industry is committed to promoting comprehensive solid waste management practices. To help you promote waste education and comprehensive recycling in your local schools and communities, the Indiana Soft Drink Association has provided the funds to develop and print "Completing the Cycle – It's Up To You."

Designed by and for Indiana Teachers to use in Grades 4-8, this curriculum guide includes numerous classroom activities that easily fit into established subject requirements. The goal is to empower the youth of Indiana and make them the leaders in waste reduction and recycling efforts. The Indiana Soft Drink Association hopes students will apply these classroom lessons to real-life situations. Students can make a difference in Indiana's waste reduction efforts.

ISDA
Indiana Soft Drink
Association

Introduction

This module is designed to provide educators with classroom activities for understanding significant environmental issues, i.e., conservation, preservation, ecology, resource management, solid waste, and recycling. While each of these environmental issues is complex and has far-reaching implications, the activities serve as a way for teachers, students, and families to begin thinking about these issues in relationship to their own lives. Most importantly, the activities are designed to give children a sense of their own power to bring about change.

This module is structured to give teachers maximum ability to modify, adjust, and fit the suggested activities into the existing social studies, mathematics, science, fine arts, health, and language arts curriculum. Teachers should modify the activities according to students' previous knowledge, interest, and skill levels. Students will begin to build a fundamental understanding of environmental issues by focusing on beliefs, attitudes, values, and observable behaviors in their own lives. Students may also be encouraged and motivated to make a difference in their schools, homes, and communities. The activities will provide students with a variety of concrete ways to organize information to draw comparisons and to see the relationships between behaviors and consequences. This module has been designed to equip the next generation of the earth's caretakers with an awareness of how **their** daily actions, and those of **their** families, affect the health of the planet. Participation in the activities is vital to goals of greater environmental awareness, responsibility, stewardship, and lasting change.

Overview

This module is a sequential unit in which each level is a foundation for the next. Responsibility, citizenship, stewardship, and environmental issues are addressed at each level.

This module is not all inclusive. Extra resources have been included to give teachers additional information. Also, since this is an evolving topic, resources will change over time.

Evaluation

The evaluation of student progress can be determined in a variety of ways. Student's thinking, decision making, and participation are not easily tested by paper and pencil tests. In addition to or, instead of, traditional testing methods, suggested alternatives should include observation, positive actions taken by the student, and self-evaluation.

State Proficiencies

The activities in the following lessons are correlated with the *Indiana Curriculum Proficiency Guide* which emphasizes the process of learning through direct experience. The following proficiency skills are integral parts of the activities.

A. Language Arts
1. Expressing feelings and ideas
2. Analyzing information
3. Critical and reflective thinking
4. Listening and responding
5. Interviewing to generate ideas

B. Social Studies
1. Tracing historical information
2. Comparing economic systems and information
3. Examining interactions between individuals and groups
4. Drawing conclusions

THE WORLD AS WE SEE IT
THE WORLD AS WE WOULD LIKE IT TO BE

C. Mathematics
1. Computing data
2. Estimating
3. Measuring
4. Recalling facts

D. Science
1. Examining events and ideas
2. Selecting and using information
3. Forecasting
4. Communicating information

E. Fine Arts
1. Expressing themselves through the arts
2. Identifying and describing characteristics of form, structure, and style

F. Health
1. Recognizing the concept that health is a right and responsibility of every individual and community
2. Applying communication skills to acquire and exchange knowledge about health
3. Using the major concepts and knowledge in health science in critical thinking
4. Internalizing the concept that health is multidimensional – mental, physical, social, emotional, and spiritual – and has an impact on the quality of life

4th GRADE

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Fourth Grade

Curriculum Areas: **Social Studies, Language Arts, Science, Fine Arts**

Objectives:

1. The students will trace the environmental changes of the native Americans of Indiana from the past to the present and describe the effects these changes have had on our natural environment.
2. The students will show responsible behaviors for their environment by protecting plant and animal habitats.
3. The students will plan alternative solutions to environmental problems and take action.

Background Information:

The Great Lakes

According to a 1985 study, the 40 million people living in the Great Lakes region are exposed to more toxic chemicals than in any comparable North American population. The region is reaping the legacy of years of burying chemical waste on the lake shores and spilling sewage and fertilizer runoff into the waters. Improvements – most dramatic in Lake Erie – have been made, but both the United States and Canada are far from complying with their anti-pollution agreements. Water takes 200 years to move through Lake Superior, so damage can linger for centuries.

Activity 1: Lifestyles – Past, Present, and Future

Proficiency/Indicator:

Social Studies

Assess how the people, events, and decisions of the past influence the present and future.

Examine the patterns and interactions of individual and group behavior.

Language Arts

Acquire speaking skills for the purpose of communicating ideas and experiences in both formal and informal situations.

Materials:

Research materials, American Lifestyles' Research Chart (Appendix A), paper, pencil.

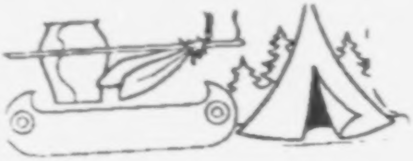
Directions:

1. Divide the class into the following three groups: Early Native Americans, Pioneers, and People of Today.
2. Instruct each group to brainstorm ways the Native Americans, Pioneers, and the People of Today use/used their environment.
3. Direct each group to research and record how these people use/used their environment.
4. Instruct each group to complete the American Lifestyles' Research Chart.
5. Compare and contrast how these people use/used their environment in a class discussion.

Extended Activities:

Choose a topic from the American Lifestyles' Chart and present one aspect that best relates to the environment, defend the position of the group in an oral discussion or in paragraph form.

Construct a diorama representing one aspect of your group's lifestyle.



> *As much as we are the root of the problem, we are also the genesis of its solution. Go to it!*
>
> *The Earthworks Group*

Activity 2: Cultivate and Adopt-a-Tree

Proficiency/Indicator:

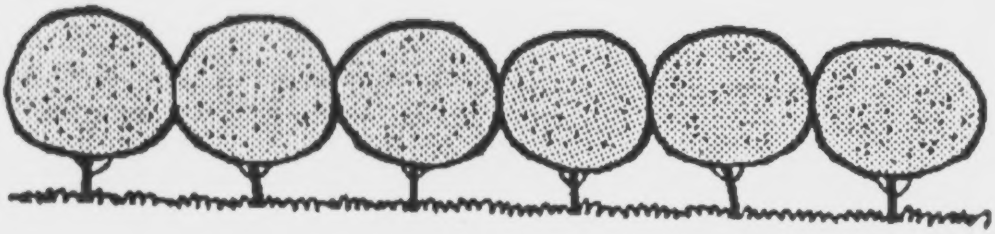
Science Use the major ideas of science in rational, creative thinking.

Materials: A PET (Polyethylene Terephthalate) plastic 2 liter soda bottle cut off at the neck, sapling tree, soil, water.

Directions:

1. Plant a sapling tree in a PET bottle.
2. Nurture, love, and water the sapling.
3. Have a party to celebrate the sapling's sixth month birthday.
4. Transplant the sapling in a designated area in the Pocket Park established by the second grade. Save the used PET bottle for reuse or recycle it.

Hint: To find a raw sapling, search between bricks, rocks, concrete, and in vacant lots.



"Adopt a Piece of the Earth," care for it; make it a place for plants to grow and a habitat for animals.

Activity 3: Start a Village

Proficiency/Indicator:

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Social Studies Assess how the people, events, and decisions of the past influence the present and future.

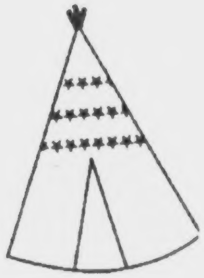
Materials: Art materials, such as: clay, paper, paint, glue, craft sticks, poster board, markers, etc.

Directions:

1. Erect in the school foyer an example of a Native American community that at one time resided in Indiana.
2. Predict the effect of today's environment on the village of yesterday.
3. Reconstruct the predictions on the village through artistic methods, i.e., drawing, painting, modeling (dioramas), etc.

Extended Activity: Invite students from other classes, parents, and administrators to view the environmental effects on the village.

Take a field trip to the Eiteljorg Museum in Indianapolis to view and compare Native American communities of other areas in the United States.



Today in America: We will lose over 800 acres of wetlands.

Activity 4: Eco-Enrichers

Proficiency/Indicator:

Science Use the major ideas of science in rational and creative thinking.

Language Arts Use writing for the purpose of discounting and expressing feelings and ideas.

Materials: Different types of soil, i.e., sand, clay, humus; worms; food scraps.

Directions:

1. Discuss the characteristics of each soil.
2. Predict the effects of the worms being in the soil.
3. Experiment with vegetable and worms to see the contributions earthworms make in enriching the soil. Place food scraps in the soil to observe the actions of the worms.
4. Document in writing the characteristics of the soil after 1 week, 3 weeks, 7 weeks, and 16 weeks.
5. Discuss the benefits of composting food and yard wastes for soil enrichment and solid waste reduction.

Extended Activity: Plant a small plant in a container of each type of soil. Document the growth of each type and compare the final growth before transplanting to an outside area.

Baking soda can be used instead of deodorant. Instructions: Sprinkle some baking soda on your finger tips, and apply under your arms. It will eliminate odors.

Activity 5: I Say Tomato, You Say Tomato

Proficiency/Indicator:

Science Appreciate the tentative nature of empirical knowledge.

Language Arts Use writing for the purpose of discovering and expressing feelings and ideas.

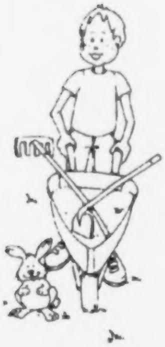
Materials: Egg cartons, potting soil, tomato seeds, metric ruler, plastic milk container.

Directions:

1. Distribute soil and plant a seed in each egg carton section.
2. Record the date planted.
3. Monitor and record the progress of the plants weekly.
4. After eight centimeters of growth, transplant the tomato plant to a plastic milk container.

Extended Activity: Present the tomato plant as a gift to someone special, along with a poem about the growth of the plant. Reuse or recycle left over materials whenever possible.

Tomato
Seeds



> *"Nature, to be commanded, must be obeyed."*
> *— Francis Bacon*

Activity 6: Indiana's Endangered

Proficiency/Indicator:

Science	Apply communication skills to exchange self-generated and acquired knowledge.
Language Arts	Acquire speaking skills for the purpose of communicating ideas.

Materials: Research materials, paper, pencil.

Directions:

1. List Indiana endangered animals on the chalkboard.
2. Divide the class into groups. Direct each group to choose one of the endangered animals.
3. Research the animal chosen to provide a written and oral report for the class.

Extended Activities:

Contact local and/or state biologists as possible guest speakers.

Construct a bulletin board of Indiana's endangered species in the hallway.

> *If possible, reuse and recycle disposables rather than tossing them in the trash.*
> *– Jeff Foote, NSDA*

Activity 7: What Else?

Proficiency/Indicator:

Science Apply communication skills to exchange self-generated and acquired knowledge.

Materials: Paper, pencil, and chalkboard.

Directions:

1. Direct each team to compile a list of things that they have thrown away in the past two days.
2. Each team will list other ways discarded items could be used.
3. The team with the most reusable items shall be declared the winner.
4. Create other rules.

YOU CAN DO IT!
RECYCLE NOW!
BEFORE
AFTER
FOAM CUP
PACKING MATERIAL
RECYLE N

> *You can recycle half-empty paint cans by participating in a paint exchange on a neighborhood-to-neighborhood basis. " Habitat for Humanity and other homeless advocacy groups often use left over or old paint on their building projects.*
> *– Jeff Foote, NSDA*

Activity 8: Create Your Own Activity

Proficiency/Indicator:

Directors:

1. Divide the class into small groups.
2. Recommend that each group develop an original recycling activity. The activity may be used in class or recommended to another class.

Extended Activity:

Compile class activities into a booklet to be used the following school year or to be passed on to another grade level.

Send copy of the booklet to:

Marty Alenduff, Recycling Coordinator
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798

RECYCLE
Glass
Paper
Cans

NOTES

5th GRADE

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Fifth Grade

Curriculum Areas: **Social Studies, Language Arts, Science, Mathematics, Fine Arts**

Objectives:

1. The students will demonstrate knowledge of waste disposal and recycling programs locally and around the country.
2. The students will examine the source of waste products and the location for the disposal of these products.
3. The students will investigate water recycling and water conservation.

Background Information:

Good Guy of the Month

Girl Scout leader Becky Harris of Roswell, Georgia, saw a resource going to waste – school supplies that were discarded at the start of summer vacation. Through her efforts, pens, pencils, glue, paint, crayons, and paper from 40 schools are salvaged by local Scouts for use at summer camps and day-care centers. The girls recycle those supplies too spent to reuse, and also distribute useful items from school lost-and- found boxes.

TO RECYCLE OR NOT TO RECYCLE?!
8
11

Activity 1: "SPAR" – State Parks and Recycling

Proficiency/Indicator:

Social Studies Investigate the geographical patterns of the major physical features on the Earth's surface.

Math Acquire skills necessary to perform written manipulations

Materials: Indiana state map.

Directions:

1. Identify on a state map the location of each state park.
2. Survey the class to identify the number of students who have visited each park. Graph the results on the chalkboard.
3. Divide the class into groups. Assign a park to each group. Instruct the students to write a letter concerning the following issues:

   How do you dispose of solid waste?
   How do you dispose of liquid waste?
   Are there recycling bins located on park premises?
   Are they convenient for public use?
   How many are available?
   What are the benefits of recycling?
4. Direct the students to prepare oral reports to be given before the class.
5. Involve the class in a discussion to summarize the data received and to draw conclusions.

Extended Activities: Write your state representative about an environmental issue concerning the state parks.

Invite state park personnel to visit and discuss waste disposal and recycling procedures at state parks.

In 1964, a bill was passed to establish America's first permanent national wilderness system. A total of 9,200,00 acres were set aside.

Activity 2: Made in the Shade

Proficiency/Indicator:

Science Use data gathering and organizational skills to identify and investigate questions and assumptions.

Materials: Paper punch, yarn, and resource books about tree and leaf identification characteristics.

Directions:

1. Discuss leaf shapes, veining, edge, simple/compounding, etc., with the class.
2. Instruct students to collect a chosen variety of leaves, i.e., tulip tree, box elder, silver maple, oak, hickory, locust, and elm.
3. Instruct the students to take the collection home to press the leaves between newspapers and mount each leaf on a standard sheet of paper.
4. Return the mounted leaves to class. Escort the students outside under shade trees to place the mountings into a booklet.
5. Discuss the importance of using recycled paper goods/products to save our trees.

Hint: This activity is best suited for early fall or late spring.

Extended Activities: Display the mountings in the school/community library or a local business.

Read *The Giving Tree* by Shel Silverstein. Discuss author's purpose and the value of a tree.

DICTIONARY

Trees and shrubs, if planted in the proper location, can reduce air conditioning electricity by 50 percent.

Activity 3: Beauty and the TRASH

Proficiency/Indicator:

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Assorted trash collected by students, glue, tape, scissors, stapler, string, markers, general art supplies.

Directions:

1. Divide into small groups. Instruct each group to design and create a trash sculpture.
2. Name your trash sculpture.
3. Invite parents and school officials for a "Beauty and the TRASH" exhibit.

Extended Activity: Create a class book including poems or short stories about students' sculptures.

WOW!
1 TON
NEWS
1 TON
1 TON
Soda
1 TON

The first step in home recycling is finding out what services are available in your community. Look in the Yellow Pages under "Recycling" or "Waste," and call today for information.

Activity 4: WANTED

Proficiency/Indicator:

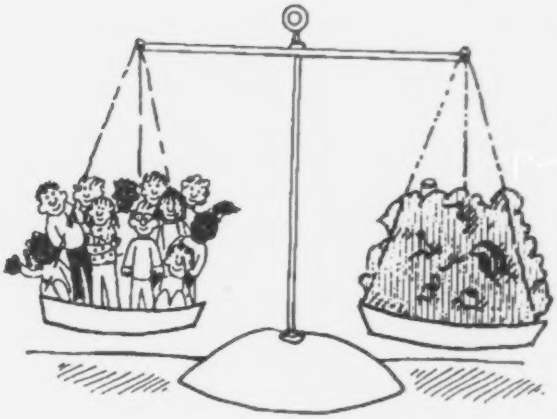
Language Arts Appreciate and understand the English language.

Use writing for the purpose of effective written communication.

Materials: Two–liter bottle, styrofoam cup, newspaper, glass jar, aluminum foil or can.

Directions:

1. Instruct the students to write a "classified ad" for the resale of one the above items. Include a description, i.e., color, weight, size, and amount, and a relevant way the item may be reused.
2. Invite the local newspaper to publish the ads during Earth Month, or publish in the school newspaper.



Aluminum can be melted down and reused an unlimited number of times. Recycling a can saves 95 percent of the energy used to make new aluminum from bauxite ore.

Activity 5: Accentuate the Positive

Proficiency/Indicator:

Language Arts

Use writing for the purpose of discussing and expressing feelings.

Acquiring technical skills necessary for effective written communication.

Acquire speaking skills for the purpose of communication.

Materials: Two–litter bottle, styrofoam cup, newspaper, glass jar, aluminum foil/can.

Directions:

1. Instruct students to list specific adjectives to describe each piece of trash in an appealing way.
2. Include a description of the item by giving color, size, weight, shape, and other physical characteristics.
3. Use a Thesaurus or a dictionary of synonyms and antonyms as a source for appropriate positive adjectives.
4. Allow each student to verbalize to the class the written results of its research.

CHANGE YOUR BEHAVIOR: How many disposable cups do you use each week? Suppose it's a dozen; if a million other people used and threw away the same amount, it would total over 12 million cups.

Activity 6: Water Watchers

Proficiency/Indicator:

Math

Acquire skills in selecting and applying relevant data to solve problems.

Acquire skills necessary to perform manipulations.

Materials: Monitor's Recording Sheet (Appendix A), access to home water meter

Directions:

1. Direct students to read and record the numbers on their home water meters before they leave for school.
2. Direct students to read and record the numbers on their home water meters when they get home from school.
3. Research and explain in writing the reasons for a change in the readings.

Extended Activity: Bring in an old water bill and calculate the cost of water used per cubic foot. (Also, calculate the cost per family member for water used during the billing period.)

Less than 1 percent of the water on Earth is available for use by people.

Activity 7: "Down to the Last Drop"

Proficiency/Indicator:

Math

Acquire skills in applying relevant data to solve problems.

Develop a positive attitude toward mathematics in personal growth.

Materials:

Access to a leaky faucet, container to collect leaking water, clock.

Directions:

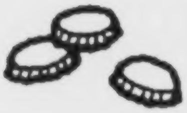
1. Direct each student to identify a leaky faucet at school.
2. Collect the drips in a container for a designated time.
3. Calculate the amount of water dripped per 24 hours.
4. Calculate the amount dripped for 180 days (a school year).

Extended Activities:

Present this information to the principal or other school official.

Conduct this activity at home and present the information to the parents.

HI, I'M "RECYCLING PETE"! I AM A PLASTIC SOFT DRINK BOTTLE AND YOU CAN RECYCLE ME!



According to The Green Consumer, "A leaking toilet can waste 200 gallons a day without making a sound."

Activity 8: This Is for the Birds

Proficiency/Indicator:

Fine Arts: Express themselves through the arts by creativity.

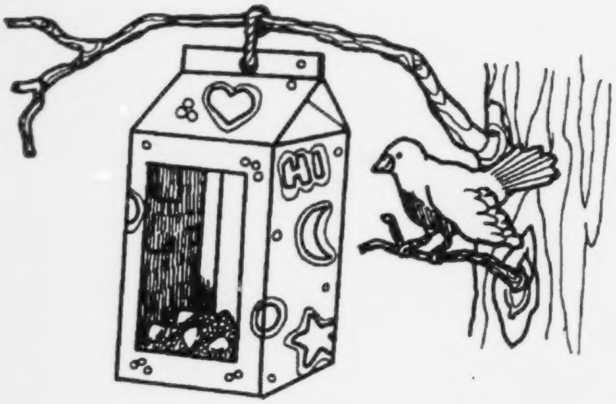
Science: Use data gathering skills.

Materials: Clean plastic milk carton, scissors, permanent markers, bird seed.

Directions:

1. Make a bird feeder from the clean milk carton. Cut out two rectangles on opposite sides large enough for birds to enter.
2. Decorate the milk carton with markers.
3. Pierce a hole in the carton and add a string to the top for hanging.
4. Fill it with bird seed and help our feathered friends.
5. Identify, observe, and record the number of birds feeding in one hour.

Note: Bird houses may also be made from two-liter soda bottles or gourds.



> *"A weed is a plant whose virtues have not yet been discovered."*
> *— Ralph Waldo Emerson*

Activity 9: File 'Em/Use 'Em

Proficiency/Indicator:

Language Arts

Use writing for the purpose of expression.

Acquire speaking skills for the purpose of communication.

Materials: Resource section in the back of this curriculum.

Directions:

1. Instruct each student to write a letter requesting available information on recycling.

   Note: A list of addresses for the resources is included in the appendix.
2. When information is received students will orally share it with the class.
3. Add the information received to the vertical file in the school library.

Extended Activity: Develop an action project to utilize information.

RECYCLING IS COOL!
TEST

THAT'S OIL, FOLKS – Keep it clean–your oil, that is. Change it regularly and use a high-quality, multigrade oil (10W-30 or 10W-40) to reduce engine friction and increase fuel efficiency. When changing oil, check fuel filters too. If they're dirty, replace them. Clogged filters use more gas.

Activity 10: Think Globally—Act Locally

Proficiency/Indicator:

Science

Use data gathering and organization skills to identify questions and assumptions.

Appraise scientific technological applications in terms of ethical effects.

Materials: Paper and pencil.

Directions:

1. Brainstorm and list the uses and discarding of toxic substances such as: motor oil, batteries, and paint.
2. Ask the students the following questions:

   What local effect do these toxins have on the water, water supply, flora, and fauna?
   Will these be long– or short–term effects?
   List alternatives for the disposal of these toxic substances.

Extended Activities:

Have a "Tox-Away" Day to collect old batteries, used motor oil, and paints.

Invite a Department of Natural Resources representative to address the above mentioned issues on local environmental issues.

Nontoxic Alternative – Instead of paint thinner, use hot vinegar. This works just as well and is much safer for the environment.

Activity 11: Create Your Own Activity

Proficiency/Indicator:

Fine Arts: Express themselves through the arts by organizing and creating.

Science Using the major ideas of science in rational creative thinking.

Materials: Variable

Directions:

1. Divide the class into small groups.
2. Recommend that each group develop an original recycling activity. The activity may be used in class or recommended to another class.

Extended Activities: Compile class activities into a booklet to be used the following school year or to be passed to another grade level.

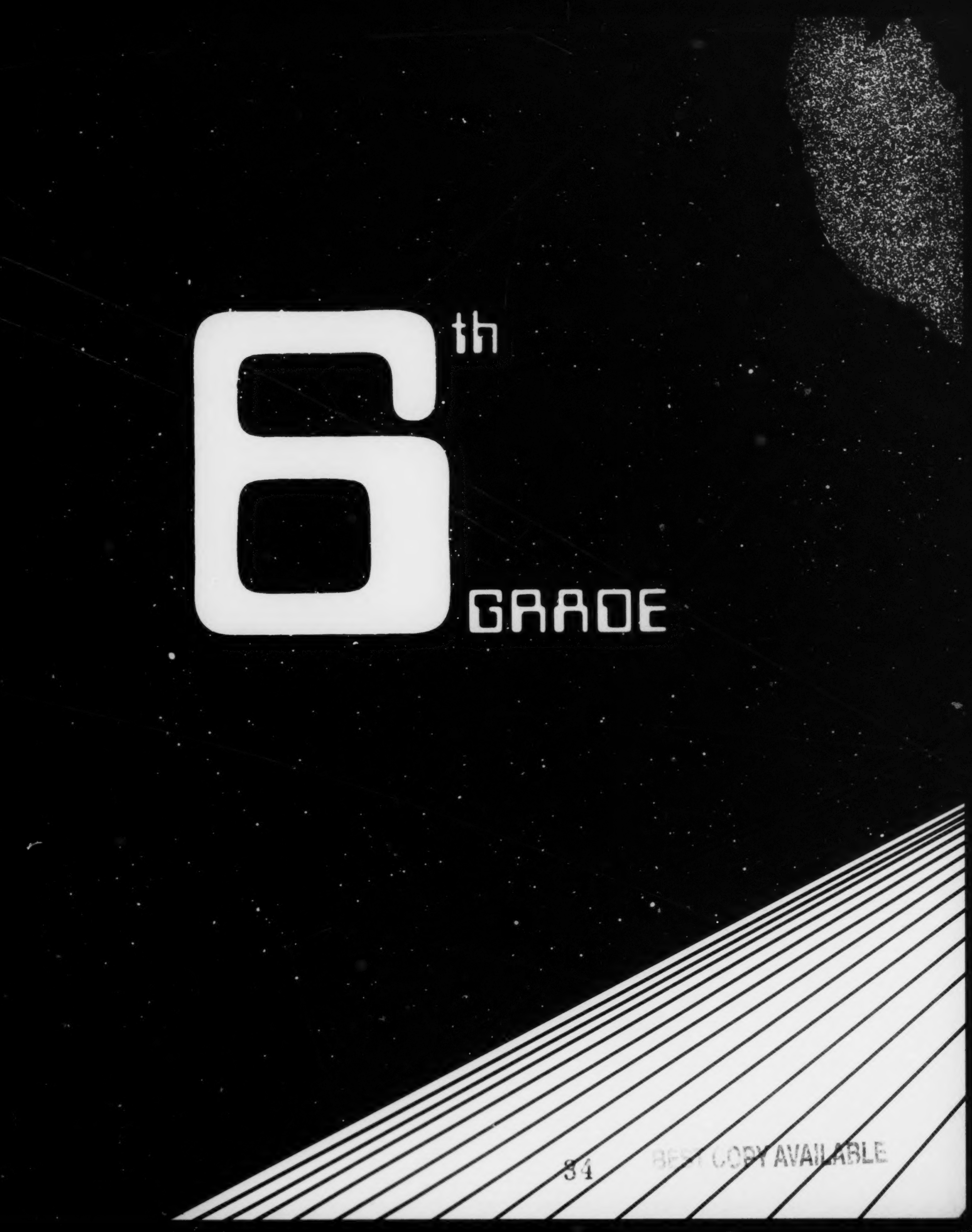
Send a copy of the class booklet to:

Marty Alenduff, Recycling Coordinator
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798

RECYCLE
Glass
Paper
Cans

> *"The supreme reality of our time is . . . the vulnerability of our planet."*
> *— President John F. Kennedy (1963)*

6th GRADE



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Sixth Grade

Curriculum Areas: **Science, Social Studies, Fine Arts, Language Arts**

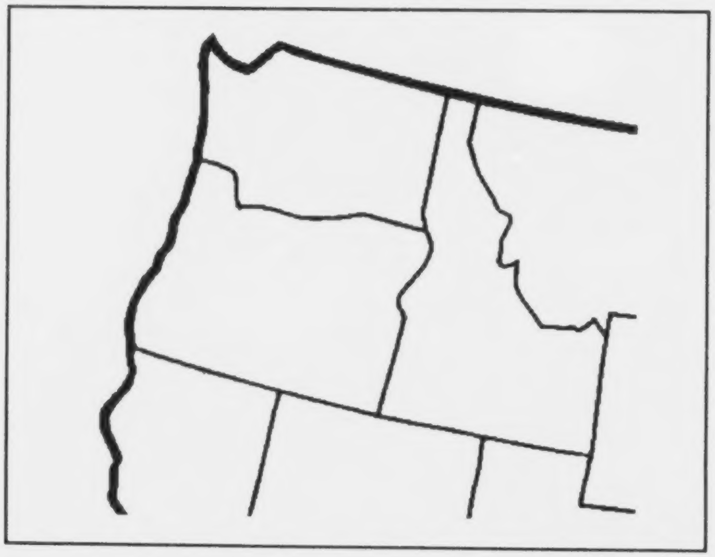
Objectives:

1. The students will be able to visualize the amount of solid waste generated for each person in Indiana.
2. The students will be able to calculate the amount of trash generated by their class and school.
3. The students will classify types of trash.

Background Information:

NORTHWEST

The magnificent forests of the American Northwest are under siege. Less than a tenth remains of the original 30 million acres of virgin forest in Oregon. Controversial efforts to save endangered species such as the spotted owl, focus on the owl's habitat, the old growth forests of the region. Lumber companies say conservation efforts cost jobs, but clear-cutting of public and private lands is at least as likely to put loggers out of work in the long run. Forest protection is needed before it's too late – a forest needs a thousand years to return to maturity.



Activity 1: What is Waste?

Proficiency/Indicator:

Science Apply communication skills to exchange self-generated and acquired knowledge.

Social Studies Examine the patterns and interactions of individual and group behavior.

Materials: Two carrots, potatoes, or oranges, vegetable peeler, knife, bottle or can of soda pop (cups optional), and a T-shirt.

Directions:

1. Talk with the students about "resources," while showing a carrot, orange, or potato. Ask students how a carrot/orange/potato is a resource, i.e., food, energy.
2. Peel the food. Ask the students to discuss the purpose of the peel. Name other things that are like this food . . . where the food to eat is "inside" something that we throw away, i.e., potato chips, candy bars, etc.
3. Show another carrot/orange/potato. Ask students "Where's the waste?" There is none . . . yet! Help the students discover that waste only occurs when the **desired** part of an item is used and the rest is discarded. Waste is only what we no longer want; waste does not mean that there is no value for others in the waste.
4. Record on the chalkboard valuable uses for the "waste" generated by the peeled food item.
5. Brainstorm valuable ways to use a soda pop can and a worn, too small T-shirt.
6. Ask students what we usually do with waste. Record what would happen if we did not view all these things as waste but as resources for **other** uses?

GYM CLOTHES

Mop— *Use an old, torn shirt, dustcloth, or other rag for sopping up small kitchen spills. That will help cut down the number of paper towels you use, which means you'll consume fewer trees, and, because bleached white paper creates dioxins, you'll cause less water pollution.*

Activity 2: How Much Is Much?

Proficiency/Indicator:

Mathematics

Develop a conceptual framework of mathematical ideas expressed as numbers, words, symbols, and figures.

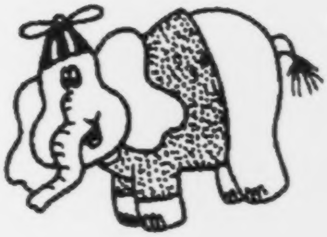
Acquire skills in selecting and applying relevant data to solve routine and nonroutine problems.

Materials:

Scales, paper, and any classroom items that can be weighed, Waste Chart and Fact Sheet (Appendix A).

Directions:

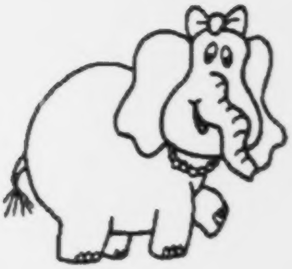
1. Discuss the concept of a ton. Break a ton into a component of pounds.
2. Divide the students into small groups. Each group is to choose a small item in the room, weigh the item, and record the weight.



3. Calculate the number of items it will take to make a pound. Identify how many of their items it will take to equal an average daily waste rate of three pounds, five pounds, and seven pounds.
4. Prepare a visual presentation to be shared with the rest of the class on the weight of these items and how many items it will take to make both a pound and a ton.
5. Give students this fact:

   If every person in New York City threw away one 16-ounce glass pop bottle, there would be 3,516,589.5 pounds of empty pop bottles – the equivalent of 440 full-grown elephants (by weight).

   Challenge the students to come up with ways to describe weight.



6. Direct students to complete the fact sheet in Appendix A.

Americans produce 195.7 million tons of garbage/trash (Municipal Solid Waste-MSW) annually or 4.3 pounds per person per day. At least half of this garbage/trash is recyclable.

Activity 3: Eeny, Meeny, Miney, Moe

Proficiency/Indicator:

Science

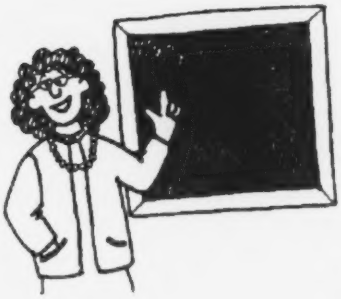
Use data gathering and organization skills to identify and investigate questions and assumption.

Demonstrate competence and confidence in applying the knowledge, processes, and attitudes of science in making informal choices.

Materials:

Signs with the words: Source Reduction, Reuse, Disposal, Recycling, Composting, Incineration, and Landfill; arrows, cost information on trash removal, teacher provided examples on different types of packaging.

Directions:



1. Display the signs and arrows to create a flow chart as discussion takes place. Discuss and list definitions of source reduction, reuse, disposal, recycle, compost, incineration, and landfill.
2. Identify different types of packaging. Determine what happens to items that are no longer wanted. Which items have value in the different steps of the flow chart?
3. Construct a matrix for comparison. A sample matrix can be found in Appendix A.
4. Analyze the results of your matrix. Discuss in class which type of packaging is the most ecologically sound. For example, are some plastic-types recycled and others not? (The term "Trade-Offs" may be introduced at this point.)
5. Discuss how these findings affect the class as consumers (Student's feelings).
6. Provide the student with information about the personal cost of waste management. Elicit ways to lower the cost, i.e., source reduction, reuse, and disposal.

Deodorizing news: Today in the United States, an estimated 69,000 gallons (261,165 liters) of mouthwash will be used.
– Earthworks

Activity 4: Make It Rot

Proficiency/Indicator:

Science

Appreciate the tentative nature of empirical knowledge.

Use data gathering and organization skills to identify and investigate questions and assumptions.

Materials:

Cotton cloth, pencil stub, leaves, a cracker, notebook paper, newspaper, glass, cardboard, banana peel, a piece of bread, plastic wrap, aluminum foil, polystyrene pellets (styrofoam peanuts), unused disposable diaper, a soda can, 15 quart-sized, zip-lock freezer bags, Data Table (Appendix A).

Directions:

1. Direct students to look at the materials under magnification and predict which materials will partially decompose. Write a hypothesis in the space provided on the worksheet.
2. Place an equal size piece of each material in its own zipper-closure bag. Label with date and name of contents. Zip the bags and place in the same location.
3. Examine the contents of the zipper-closure bag and record findings one week later. Repeat this step at the end of the second week.
4. Classify the materials in the zipper-closure bags into two groups, no change and change. Throw away the "change" bags unopened. Some mold can make you sick. Save the "no change" items to be used in the "Rot Chamber," Activity 6.
5. Discuss what each group has in common.

Notes:

Make It Rot and **Banana Breakdown** should be done simultaneously. Each of the materials (excluding zipper-closure bags and data tables) should be cut as equally as possible.

"Come forth into the light of things, let nature be your teacher."
– William Wordsworth – "The Tables Turned" (1798)

Activity 5: Banana Breakdown

Proficiency/Indicator:

Science Appreciate the tentative nature of empirical knowledge.

Materials: Five equal pieces of banana peel, five quart–sized, zipper-closure freezer bags, water, yard or garden soil, Variable Chart (Appendix A).

Hint: Do not use potting soil for this activity. It does not contain the necessary microbes to break down the items.

Directions:

1. Brainstorm what helps materials rot or break down? Air? Water? Wind? What else?
2. Put a piece of banana peel in each zipper-closure bag. Record on the variable chart what you see, i.e., color, shape, texture.
3. Use all but one of the bags to test variables (changes that might or might not make the banana peel rot). The following are just four variables you may use. More "Banana Breakdown" bag ideas may be tested.

   Water – Add enough water to the first bag to cover the peel. Squeeze out **most** of the air. Seal the bag.

   Dirt with microbes – Cover the peel in the second bag with dirt. Again, squeeze out most of the air and zip or shut.

   Light – Squeeze and seal the third bag. Tape it to a sunny window.

   Lots of Air – Poke holes in the fourth bag. Leave it open. (This may lead to discussion about odor from landfills.)

4. The fifth bag is your control. (Don't add any variables.) Squeeze out most of the air and zip it shut. Put all the bags except the "Light" one in a dark place.
5. Look at the bags in one week (but don't open them). Record your observations. Has the color changed? The texture? What else? Continue to observe and record changes.

Activity 6: Rot Chamber

Proficiency/Indicator:

Science

Use data gathering and organization skills to identify and investigate questions and assumptions.

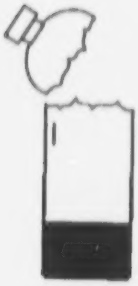
Apply communication skills to exchange self-generated and acquired knowledge.

Materials:

Use the materials collected in the "Make It Rot" and "Banana Breakdown" activities, clear plastic jar or bottle.

Directions:

1. Analyze the data from "Make It Rot" and "Banana Breakdown" activities. Differentiate which variables make the banana peel rot.
2. Direct students to use what was learned to make group Rot Chambers. Fill a plastic jar with trash. Add soil or water, if they like. Show how else the Rot Chamber can be designed to make the trash break down faster, i.e., holes in a straw run through the center of the chamber to get more air. Encourage students to use different approaches.
3. Choose a place to store each Rot Chamber. Light or dark, warm or cool?
4. Let it rot! (If the chamber is opened, wear rubber gloves.)
5. How well does each Rot Chamber work? What could be changed to make it work better? What might happen if the chamber were left to rot for the rest of the school year?
6. Could any of the trash in your Rot Chambers have been recycled or reused?



Extended Activity:

Tour a landfill. Direct students to design a questionnaire to determine people's attitude toward landfills. People to be interviewed may include representatives from the food, health care, fire and safety, school, park, citizens, businesses, manufacturing, waste management, and political sectors.

Activity 7: Pile It On

Proficiency/Indicator:

Fine Arts Express themselves through the arts by organizing and creating.

Science Use the major ideas of science in rational, creative thinking.

Materials: Three two-liter plastic bottles, netting, wire to tie off netting, pamphlet on composting from community sanitation services or the local extension office.

Directions:

1. Discuss composting with students or invite a guest speaker in to speak to the class about composting. A compost can be as simple as a container with air holes punched in it. Some composters have doors near the bottom to allow for the removal of the compost.
2. Construct three bottle composters as shown in Appendix A.
3. Use twigs, leaves, grass clippings, and pine needles to fill composters.
4. Allow to decompose. Material should be kept moist not soaking. This allows for discussion on the rate of decomposition.
5. When the material resembles rich soil, remove it for use in your garden or around the school grounds.

Grass clippings and leaves are the second largest component of a municipal landfill (20 percent).

Activity 8: Sink or Swim

Proficiency/Indicator:

Science

Appreciate the tentative nature of empirical knowledge.

Use data gathering and organizing skills to identify and investigate questions and assumptions.

Materials:

Sugar, rubbing alcohol, dishwashing liquid, water, samples of various plastics brought in by students, two containers per group.

Note:

All foam polystyrene will float, so using polystyrene utensils and clear "take-out" trays instead of foam works better.

Directions:

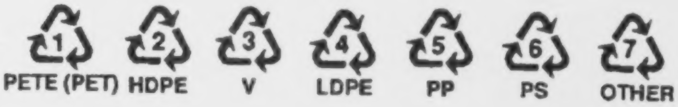
1. Prepare the following two solutions for each group:

   Sugar water = five teaspoons sugar in two and a half ounces of water plus small amount of food coloring

   Alcohol water = one tablespoon rubbing alcohol with enough water to make three ounces of liquid. Adding a drop or two of dishwashing liquid will lower surface tension and help plastic get wet.

FOAM POLYSTYRENE

2. Students cut small pieces from containers or bottles they have collected at home and fill in the Data Sheet (Appendix A) on plastics identification using the two solutions. Use the chart to predict what type of plastic each sample is. (Some teachers may choose to precut the plastic in quarter inch pieces and color code with permanent markers.)
3. Discuss predictions and actual findings as a class when everyone is finished testing. Make a class list of where students got each kind of plastic: **HDPE** – milk bottle, detergent bottles, orange juice bottles; **PP** – catsup bottles, yogurt cups; **PET** – soft drink bottles; **V** – shampoo bottles, salad dressing bottles, vinyl seats; **PS** – foam cups, prescription bottles, knives, forks, and spoons; **LDPE** – shopping bags. To insure the resin used, consult the container.



> *"Walk gently on the Earth."*
> *– Grey Eagle (Joe Wright)*

Activity 9: In for a Penny, In for a Pound

Proficiency/Indicator:

Mathematics

Develop a positive attitude toward mathematics and appreciate the role of mathematics as a method for making predictions about societal trends.

Acquire skills in visualizing and interpreting mathematical relationships and communicating these ideas.

Social Studies

Examine the patterns and interactions of individual and group behavior on natural resources.

Materials: In for a Penny, In for a Pound Worksheet (Appendix A).

Directions:

1. Divide the class into groups of two.
2. Instruct the students to work together to find the answers to the questions on the worksheet.
3. Discuss their answers.

Extended Activity: Discuss what environmental projects you could help support by using your recycling dollars.

> *"Nobody made a greater mistake than he who did nothing because he could only do a little."*
>
> *– Edmund Burke*

Activity 10: Sun Fun

Proficiency/Indicator:

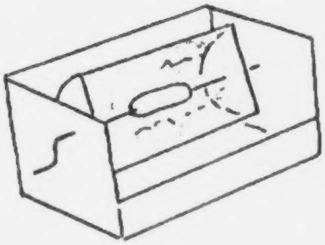
Science	Demonstrate competence and confidence in applying knowledge, processes, and attitudes of science.
Fine Arts	Express themselves through the arts by organizing and creating.

Materials: Metal cooking foil, cardboard shoe box, poster board, glue, tape, piece of wire from a coat hanger, hot dog, or some other food.

Directions:

1. Cut the front from a strong shoe box.
2. Cut a disk from the poster. Cut it in half.
3. Use a rectangle of poster board and the two semicircles to make a trough shape.
4. Line the inside of the trough with cooking foil.
5. Attach the trough and your food to the shoe box with the wire.
6. Place the cooker in the sun. Keep turning your food so that it cooks evenly.

   ALWAYS make sure all food is cooked thoroughly. Ask an adult to test it.



The location of your appliances affects their energy efficiency. For example: If possible, avoid installing a dishwasher next to a refrigerator; the heat and moisture from the dishwasher will make the fridge work harder to stay cool, using more energy. If you can't separate them, insulation can minimize the effect.

Activity 11: Food For Thought – Eco-Lunch

Proficiency/Indicator:

Science

Demonstrate competence and confidence in applying the knowledge, processes, and attitudes of science in making informed decisions.

Social Studies

Assess how the people, events, and decisions of the past influence the present and future.

Materials:

Each child should bring a sack lunch to school. (Inform students in advance without relaying the purpose of the lunch.)

Directions:

1. Advise the students not to throw anything away while they are eating their lunch.
2. Eat and enjoy lunch. (The teacher should observe the packaging of lunches to begin discussion.)
3. Discuss and record in column form the different types of packaging. Are they reusable, recyclable, compatible, or disposable packaging containers.
4. Have an award (pencil, sticker, certificate, poster, etc.) for the student who had the best "garbageless" lunch.

Extended Activity:

Repeat the activity in one week or on a regular basis to **show their awareness** of excessive packaging

Doug
Cathy
SUE
Ben
ANDY W.
JOE
Jesse
NOEL
BETH
ALAN

How many Americans will be carrying their lunch to work or school today?
A) 34 million
B) 44 million
C) 54 million
Answer: A. If you're one of them, try bringing a lunch box instead of a paper bag; take paper bags home and reuse them; and use reusable plastic containers instead of foil and plastic wrap, or sandwich bags.

Activity 12: Every Litter Bit Hurts

Proficiency/Indicator:

Social Studies

Develop a reasoned commitment to those civic values needed to function responsibly in a democratic society.

Examine the patterns and interactions of individuals and group behavior on society and the environment.

Materials: Large trash bags, rakes, boxes (for glass items), gloves.

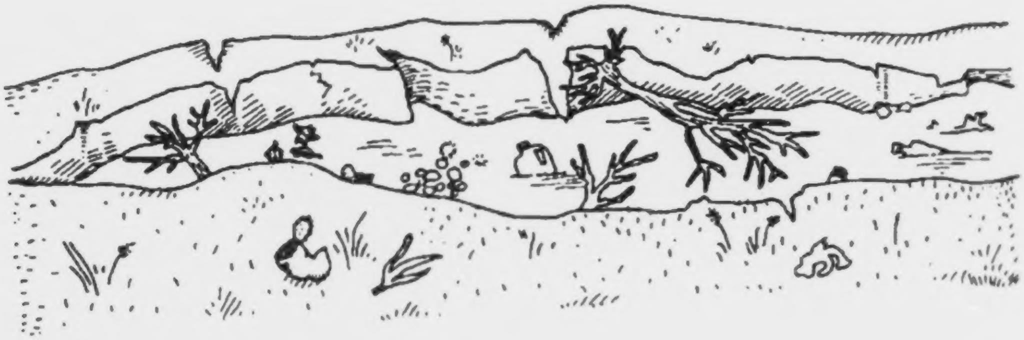
Directions:

1. Divide the class into manageable groups. Use parents for adult supervision. Assign each group a location to clean up. The city parks department may have suggestions of places to be cleaned up.
2. Contact the police department and waste management department for coordination, supervision, and assistance.
3. Divide the materials from the list above equally among the participants.
4. Separate the trash being collected into categories, i.e., paper products, plastics, cans, nonrecyclables, and glass. Arrange to have them delivered to local recycling centers.
5. Recognize and reward the cleanup participants. Local businesses might be willing to donate food coupons, T-shirts, buttons, certificates, etc.

Extended Activities:

Count and weigh the number of pieces of trash by categories and construct a bar graph of your findings.

Contact your state highway department to adopt a highway or contact a similar agency to “adopt” a vacant lot or park in school district.



Activity 13: Can You Picture That?!

Proficiency/Indicator:

Science Use major ideas of science in rational, creative thinking.

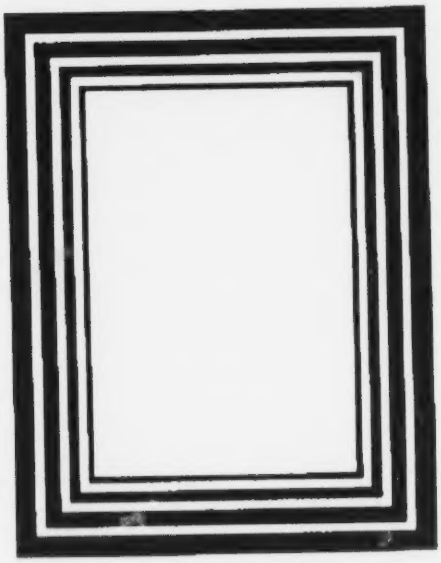
Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Aluminum can, paper, and pencil.

Directions:

1. Divide the class into small groups.
2. Have each group brainstorm and record ways to reuse an aluminum can. Be as creative as possible.
3. Have each group share its answers with the class.

Extended Activity: Produce your ideas in poster form.



In 1991, 62.4 percent of all aluminum cans sold were recycled.

Activity 14: Days of Our Can

Proficiency/Indicator:

Science

Use data gathering for generating skills to identify and investigate questions.

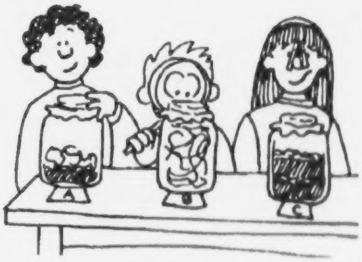
Apply communication skills to exchange self-generated and acquired knowledge.

Use writing for the purposes of discovering and expressing feelings and ideas.

Materials: Research materials, paper, pencil, markers.

Directions:

1. Talk about the concept of personal history.
2. Divide the students into small groups and investigate the beginning of a product's life, i.e., virgin material, retrieval methods, and manufacturing processes.
3. Identify every conceivable phase of the material until its "death." Consider issues, such as energy use in the manufacture, transportation, and refrigeration of the product.
4. Construct a timeline of that particular product from its "birth" to its "death." Include pictures that represent each stage.
5. Share timelines with the class.



Extended Activities:

Write an autobiography from the product's point of view. Include in your personification a description of color, height, weight, personality, and the product's feelings toward being "trashed." Illustrate the story.

Many things taken for granted in your daily life contribute to the problem of garbage. **Imagine trying to live for a day without doing anything that contributes to solid-waste pollution. Write a story describing what such a day would be like.**

Remember: *As much as we are the root of the problem, we are also the genesis of its solution. Go for it!*

– The Earthworks Group

Activity 15: You Can Make a Difference

Proficiency/Indicator:

Language Arts

Appreciate and understand the English language and its relationships to culture and human experience.

Use writing for the purposes of discovering and expressing feelings and ideas while acquiring the technical skills necessary for effective written communication.

Social Studies

Examine the patterns and interactions of individuals and group behavior on manufacturing trends.

Materials: Pencil and paper.

Directions:

1. Have students select one of the following:
   - A) Students could petition a fast food chain to use more recycled and recyclable containers.
   - B) Write articles and design ads about the positive use of cloth diapers.
   - C) List creative uses for old containers (i.e., birdhouse from milk carton).
   - D) Create gifts from throwaways. (Christmas, birthday, etc.)
   - E) Think of three new uses for each of the following: plastic egg cartons, bottle caps, plastic bags, and newspapers.
   - F) Write a letter to a toy company or food packager about how its packaging could be changed to be as efficient, but less wasteful or damaging to the environment.
   - G) Write a brief essay that either supports or refutes the following statement. “I think this whole environmental thing has gone too far. If industrial profits go down because of all these government regulations, the country will be worse off than ever.”

Activity 16: Go Fly a Kite!

Proficiency/Indicator:

Science Demonstrate competence in applying the knowledge, processes, and attitudes of science.

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Paper or plastic grocery bags, string, dowel rods (or similar material), tape, markers.

Directions:

1. Experiment by designing or constructing kites out of paper or plastic grocery bags.
2. Conduct a class competition on which kite flies the highest, is the longest, is the best decorated, is most original, or is most creative.

> *"The earth we abuse and the living things we kill will, in the end, take their revenge for in exploiting their presence, we are deminishing our future."*
>
> *– Marya Mannes – Move In Anger (1958)*

Activity 17: Create Your Own Activity

Proficiency/Indicator:

To be decided by students.

Materials: To be decided by students.

Directions:

1. Divide the class into small groups.
2. Recommend that each group develop an original recycling activity. The activity may be used in class or recommended to another class.

Extended Activities: Compile class activities into a booklet to be used the following school year, or to be passed on to another grade level.

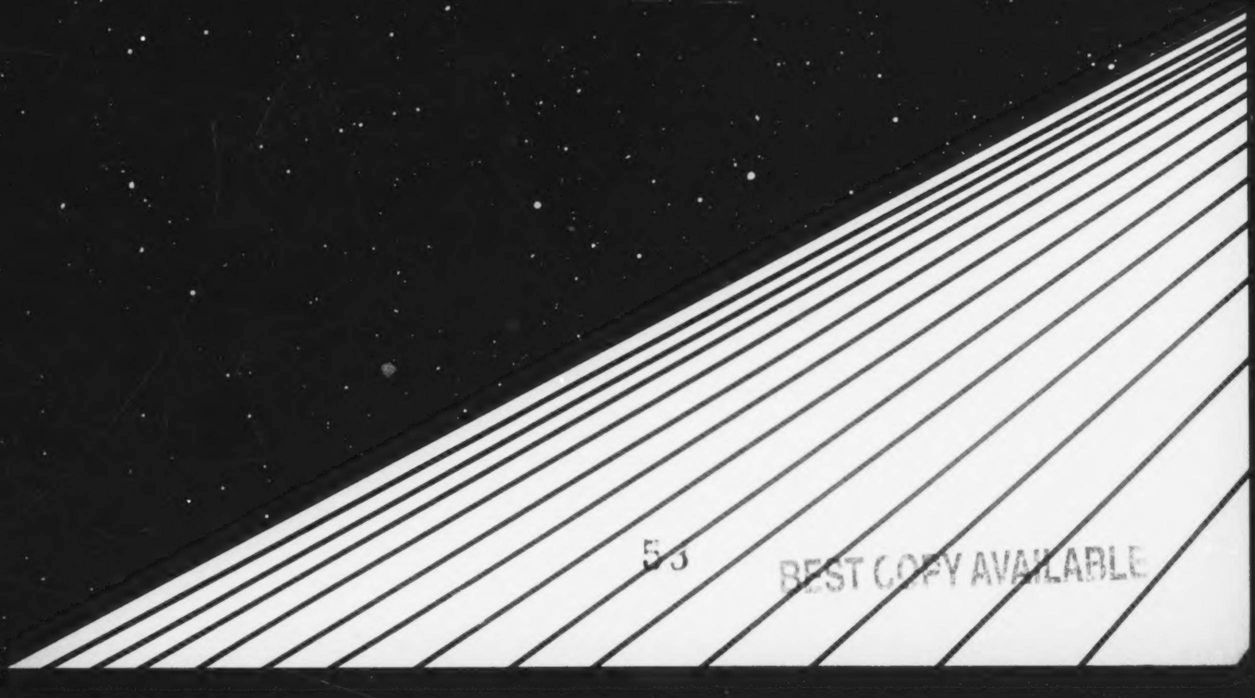
Send a copy of the booklet to:

Marty Alenduff, Recycling Coordinator
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, Indiana 46204-2798

RECYCLE
Glass
Paper
Cans

> *"The supreme reality of our time is . . .vulnerability of our planet."*
> *– President John F. Kennedy*

7th GRADE



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Seventh Grade

Curriculum Areas: **Social Studies, Fine Arts, Language Arts, Science, Mathematics, Health**

Objectives:

1. The students will calculate amounts and types of trash generated by certain groups.
2. The students will realize the value of reusing and recycling.
3. The students will understand solid waste and landfill.

Background Information:

OZONE

That CFCs must be eliminated to save the earth's protective ozone is obvious – one study shows that ozone in the atmosphere has diminished 10 percent since 1967. Refrigerant gases will still be needed for cooling, freezing, and air conditioning. Some CFC alternatives have their own ozone-depleting and greenhouse effects; others are explosive (propane) or poisonous (ammonia). All are less efficient refrigerants and must be phased out. And, they are being phashed out.

Activity 1: Recycle Your Own Paper

Proficiency/Indicator:

Social Studies Analyze current issues and hypothesize about their impact upon the present and the future.

Fine Arts Express themselves through the arts by organizing and creating.

Materials: Two-and-a-half single pages from a newspaper, a whole section of newspaper for blotting, a blender or egg beater, mixing bowl, two cups of hot water, a square pan, a piece of window screen that fits inside the pan, a measuring cup, a round jar or rolling pin, two tablespoons of liquid starch.

Directions:

1. Tear the two-and-a-half pages of newspaper into tiny pieces and put into blender or mixing bowl if using an egg beater.
2. Pour two cups of hot water into the blender and switch the blender on for a few seconds or until the paper is turned into pulp. (Add starch and blend again – optional.)
3. Place the screen in a pan containing one inch of water into the pan.
4. Pour one cup of blended paper pulp over the screen and spread evenly.
5. Lift the screen and let the water drain.
6. Place the screen, pulp side up, into the middle of the newspaper and close the newspaper.
7. Carefully flip over the newspaper section so the screen is on top of the pulp. This step is very important.
8. Roll the jar or rolling pin over the newspaper to squeeze out excess water.
9. Leave the newspaper open, and let the pulp dry for at least 24 hours.

An average American uses 580 pounds of paper a year. See if you can use both sides of every single paper that crosses your desk today.

Activity 2: Trash Pen Pal

Proficiency/Indicator:

Social Studies Draw conclusions or make decisions based on relevant data derived from a variety or sources.

Language Arts Use writing for the purpose of discovering and expressing feelings and ideas while acquiring the technical skills necessary for effective written communication.

Materials: List of foreign correspondent contacts (Appendix A), paper, and pencil.

Directions:

1. Direct students to write three paragraphs:
   a) describing the trash in your hometown
   b) brainstorm solutions to the problems of trash in your hometown
   c) ask the contacts to respond in writing about the problems of trash in their area of the world
2. Divide into small groups and critique each other's letter.
3. Reedit, redraft, and mail the letter.
4. Collect responses and share oral presentations to the whole class.

The United States has six percent of the world's population but uses almost 50 percent of the world's nonrenewable resources.

Activity 3: Surfs Up!

Proficiency/Indicator:

Science Use data gathering and organization skills to identify and investigate questions and assumptions.

Language Arts Appreciate and understand the English language and its relationship to culture and human experience.

Materials: Paper, pencil, collected trash, and debris from a shore, beach, or road.

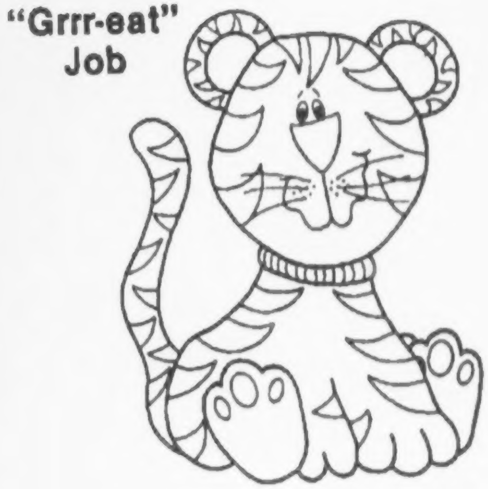
Directions:

1. Collect trash and debris along a shore, beach, or road for a period of time.
2. Sort, classify, and record each item collected.
3. Discuss as a group the different types of garbage.
4. Write an exaggerated (make believe) paragraph about your findings.
5. Present the paragraph orally to the class.

Extended Activity: Pretend that you are a piece of the collected trash in a body of water. Hypothesize how you got into the water and how you feel about being discarded.

The oceans are just as diverse as the land. There are millions of varieties of plants and animals and many different marine habitats. The oceans also contain many natural resources useful to man including food, minerals, and energy.

Activity 4:	**Weaving Weaver**
Proficiency/Indicator:	
Fine Arts	Express themselves through the arts by organizing, creating, and performing.
Materials:	Potato or onion sacks, tape, and yarn.
Directions:	1. Cut squares from potato or onion sacks and tape the edges. 2. Use yarn to weave in and out, over and under to make a design. Weaving pattern should alternate rows by starting under on one row and over on the next.



What can you do with still wearable old clothes? Recycle! Take them to a community shelter or second-hand store.

Activity 5: Eco–Message

Proficiency/Indicator:

Science	Apply communication skills to exchange self-generated and acquired knowledge.
Language Arts	Understand and experience the ways in which writing enriches life.
Fine Arts	Know the role the arts have played and continue to play in the life of man.

Materials: Markers, paper, T-shirt, old sheet (or other plain material), and a yardstick.

Directions:

1. Design a postage stamp in honor of the earth.
2. Use recycled paper to create a bookmark.
3. Decorate a T-shirt with an environmental slogan. (Reuse a T-shirt whenever possible.)
4. Write an environmental message that could appear as a bumper sticker.
5. Construct a banner or flag to tell people how you feel about the environment. (Reuse an old bed sheet and attach it to a yardstick.)

Extended Activities:

Display the projects in a public place.

Devise a school-wide competition.

Manufacture bumper stickers or bookmarks for sale. You may donate the profits to a local environmental agency.

> *"Take what you can use and let the rest go by."*
> *– Ken Kesey*

Activity 6: Trash Poetry

Proficiency/Indicator:

Language Arts

Understand and experience the ways in which writing enriches life.

Acquire writing skills for the purpose of communicating ideas.

Materials: Paper and pencil.

Directions:

1. Write a cinquain.

Cinquain Formula:

one noun subject
two adjectives related to noun
three verbs ending in -ing
four words describing your special feelings about the subject
one noun renaming the subject in a different way

Sample Cinquain:

Container
Clear, Flexible
Sloshing, Fizzing, Spewing
Wasteful if not recycled.
Liter bottle

In 1991, 54 percent of all soft drink containers produced were recycled. Soft drink containers are the most recyclable and recycled packaging in America.

Activity 7: Newspaper News

Proficiency/Indicator:

Mathematics	Acquire skills necessary to perform routine manipulations to solve problems.
Social Studies	Analyze the interaction of people and institutions in economic systems.

Materials: One copy of a local newspaper.

Directions:

1. Collect one copy of the local newspaper for one week.
2. Weigh the collected newspapers.
3. Determine how many families in the class subscribe to the paper.
4. Calculate the weight of newspapers generated by one class for one week.
5. Discuss alternatives to throwing these away.

Extended Activities: Repeat the activity calculating the volume.

Research the amount of time it takes to biodegrade a daily newspaper. If appropriate, perform a class experiment.

According to a 1990 study, paper and paperboard constitute about 32 percent of what we throw away. Research the amount of paper and paperboard recycled in 1991 and 1992.

Activity 8: Harmless or Harmful

Proficiency/Indicator:	
Social Studies	Analyze information in order to make rational choices as participating citizens in a democratic society.
Health	Evaluate applications of scientific discoveries in health terms of their overall effects.
Materials:	Paper and pencil.
Directions:	1. Generate a list of different types of trash, i.e., apple cores, gasoline, toxic waste. 2. Divide into small groups and rank the examples on a scale from least harmful to most harmful. 3. Think of safer ways to dispose harmful waste.
Extended Activities:	Research the effects of different kinds of toxic wastes on plant and animal life. Read the book *Silent Spring* by Rachel Carom to your class.

Use latex paint whenever possible – it's less toxic to produce and use. And never dispose of paint by pouring it on the ground; it can seep into the groundwater and pollute it. Just seal it in a can, label, and store it. (or donate it to a local theater production company).

Activity 9: Not in My Backyard

Proficiency/Indicator:

Science Use organization skills to identify questions and assumptions.

Social Studies Assess how the people, events, and decisions of the past influence present and future.

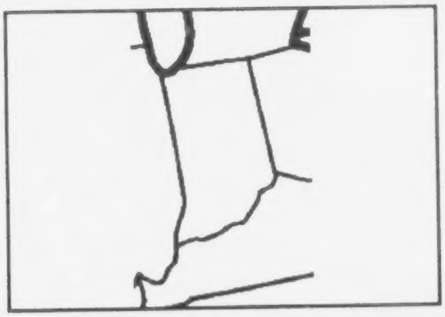
Materials: Several maps of your city and/or county.

Directions:

1. Provide several city and/or county maps.
2. Discuss locations for potential landfill or incinerator sites.
3. Analyze each possible site. Develop a matrix to determine the most desirable spot for the people of your community. (Keep in mind the water supply, traffic, odor, etc.)

Extended Activities: Prepare rules or laws about waste disposal which you think would help solve the problem. Defend your rules or laws.

Contact local governing agencies to learn laws and regulations concerning landfills and/or incinerators.



A ton of paper made from 100 percent wastepaper, instead of virgin fibers, saves 17 trees, 7,000 gallons of water, 60 pounds of air-polluting effluent, 4,100 kilowatts of energy, three cubic yards of landfill space, and taxpayer dollars which otherwise would be used for waste-disposal costs.

Activity 10: TV Time

Proficiency/Indicator:

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Video recorder, television, and a product of their choice.

Directions:

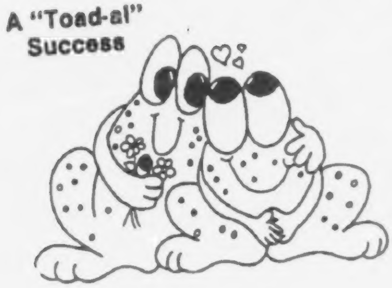
1. Divide the class into small groups of two or three.
2. Design an ad for television that will sell a product for creative reuse, i.e., try to sell a used plastic milk jug for someone else's reuse. The commercial should be a 30-second spot.
3. Record the commercials with a video recorder and show them to the class.
4. Critique and vote for the best commercial/ideas for reuse.

Extended Activities:

Design and produce a television commercial for television to stimulate participation in the local recycling program.

Design and produce a television commercial on the benefits of composting yard and food waste.

Send the spot to the local television stations for use as a public service announcement.



Save energy and landfill space – recycle your glass jars and bottles.

Activity 11: Water Things That Make You Sick

Proficiency/Indicator:

Health Use the major concepts and knowledge in health science in critical thinking.

Social Studies Analyze current issues and hypothesize about their impact upon the present and the future.

Materials: Research material, paper, and pencil.

Directions:

1. Divide the class into five groups.
2. Instruct each group to select a major city around the world which suffers from water pollution.
3. Write a description of any related health problems experienced by the residents of these cities.

Extended Activities: Interview someone from a nearby governmental agency dealing with problems of marine pollution. Find out what any citizen can do to reduce the amount of pollution. The interview can be conducted over the phone or in person. Before you do the interview, make sure that you have a list of questions you can ask. Make a chart of the suggestions to be displayed at school.

Prepare and perform a skit for your class that includes at least ten facts about pollution.

Make a chart that explains how global ocean currents can spread pollutants from one part of the planet to another. Also indicate on the chart how specific pollutants from one area might be found in a distant part of the earth's oceans.

Mercury is a toxic heavy metal that has reportedly become a major source of contamination at some hazardous waste dumps.

Activity 12: Toxics

Proficiency/Indicator:

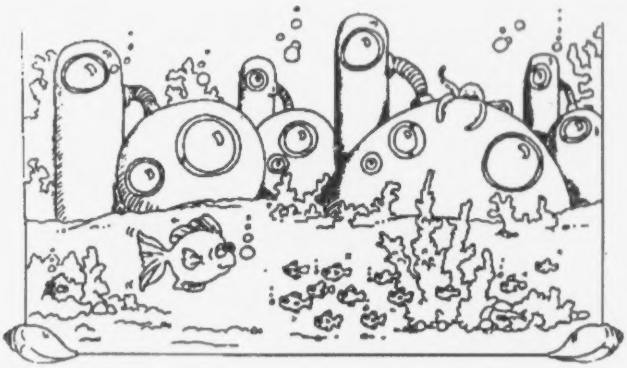
Science Apply communication skills to exchange self-generated and acquired knowledge.

Language Arts Appreciate and understand the English language and its relationship to culture and human experience.

Materials: Research materials, paper, and pencil.

Directions:

1. Divide the class into five small groups and assign one of the following topics:
   A. Make a drawing of a factory that recycles its waste products rather than producing toxic waste contaminants which may enter the oceans, streams, and rivers.
   B. Make a list of at least five different kinds of toxic chemicals that are dumped into the oceans, streams, and rivers each year. Explain how the chemicals are used.
   C. Make a list of toxic household chemicals, detergents, etc., which end up in the oceans. Then, make a list of nontoxic biodegradable substitutes. Compile your list and make an advertisement or produce a commercial promoting the "better alternative."
   D. Research what one state is doing to reduce water pollution. Make a chart explaining its efforts.



> *"We can never have enough of nature."*
> *— Edward Abbey*

Activity 13: Adopt a Spot

Proficiency/Indicator:

Social Studies

Describe the geographical patterns and relationships of the major physical, and cultural features on the earth's surface.

Draw conclusions or make decisions based on relevant data derived from a variety of sources.

Materials: A map of local area, a list of local wildlife, a list of local conservation offices.

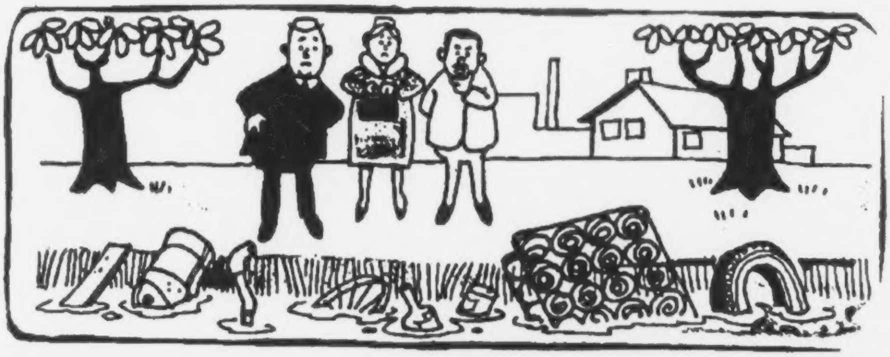
Directions:

1. Identify a local stream, river, or pond that needs your help using the list of clues below:

   CLUES THAT A BODY OF WATER IS IN TROUBLE:

   - There is no aquatic life in the stream.
   - Runoff from nearby roads or towns is flowing into the water.
   - The banks of the body of water are eroded.
   - The body of water is wider and deeper than it once was.
   - The water is murky, sudsy, or discolored.
   - There is garbage floating in it.
   - It is filled with fallen branches and leaves.

2. Brainstorm suggestions of what you can do to clean up the stream, river, or pond.
3. Set up a timetable in which to accomplish your goals.



On October 18, 1972, Congress, overriding President Nixon's veto, passed the Water Pollution Control Act establishing industry-wide standards.

Activity 14: To Recycle or Not to Recycle – That Is the Question

Proficiency/Indicator:

Mathematics Acquire skills necessary to perform routine manipulations.

Materials: Charts 1 and 2 from Appendix A.

Directions: Consider the following scenario:

1. You are going to start your own beverage company. Determine the amount of energy it takes to put beverages in 16-ounce containers made of glass, aluminum, and plastic. Energy is the amount of power and electricity it takes to produce a product. It is measured in BTUs. Once you know how much energy it takes to make the containers, you can estimate how much to charge for the beverages.
2. Calculate how much energy in BTUs make 100 containers in each of the three materials using new ingredients.
3. Calculate how much energy in BTUs it takes to make 100 containers in each of the three materials using recycled ingredients.
4. Using the information from the above questions answer the problems on the following page.

Let's Recycle!
POP
SODA

Towns in at least six states use landfill reclamation mining usable resources from dumps and promoting biodegradation of wastes which might not otherwise decay. Support such efforts in your area to extend the life of your local landfill.

Glass Equations

1. How many BTUs does it take to make 100 glass bottles if 12 are made of only recycled materials, and the rest are made of nonrecycled materials?

2. How many BTUs would it take if 50 of the bottles were made of all recycled materials and 50 were made of nonrecycled materials?

3. How many BTUs could you save for every 100 bottles if people recycled half of their glass bottles, instead of the 26 per 100 they are recycling now? HINT: Subtract your answer for question two from your answer to question one.

Aluminum Equations

1. How many BTUs does it take to make 100 aluminum cans if 55 are made of recycled materials and the rest are made of all new materials?

2. How many BTUs would it take if 85 of the cans were made from all recycled materials and the rest from nonrecycled materials?

3. Again, how many BTUs could you save if people recycled 85 percent of their aluminum cans?

Plastic Equations

1. How many BTUs does it take to make 100 plastic bottles if 20 are made of all recycled materials, and the other 80 are made of all new materials?

2. How many BTUs would be used if 50 of the bottles, or 50 percent, are made of all recycled materials, and the rest are made from all new materials?

3. How many BTUs would you save if this were true?

Activity 15: Create Your Own Activity

Proficiency/Indicator:

To be decided by students.

Materials: Paper and Pencil.

Directions:

1. Divide the class into small groups.
2. Recommend that each group develop an original recycling activity. The activity may be used in class or recommended to another class.

Extended Activities: Compile class activities into a booklet to be used the following school year or to be passed on to another grade level.

Send a copy of the booklet to:

Marty Alenduff, Recycling Coordinator
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, Indiana 46204-2798

RECYCLE
Glass
Paper
Cans

In many areas, daily newspapers are delivered in polyethylene bags. Ask your supermarket if they will accept these bags as part of their grocery bag recycling campaign.

NOTES

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8th GRADE

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Eighth Grade

Curriculum Areas: **Science, Mathematics, Social Studies, Language Arts, Fine Arts**

Objectives:

1. The students will be able to investigate their community's solid waste disposal issues.
2. The students will be able to examine the use of renewable and nonrenewable natural resources.
3. The students will be able to suggest ways to change their lifestyle and preserve natural resources.

Background Information:

HAZARDOUS WASTE

More than 90 percent of federal resources for hazardous waste control are spent on "end of the pipe" solutions. A better approach is toxic waste minimization. Many means are used to achieve this end. Raw materials that introduce fewer hazardous substances can be substituted during manufacturing. Products can be reformulated. New equipment can be installed and better plant operations instituted. These approaches carry their own price tags, but with the cost of incinerating one barrel of solvent at $2,000, they can be made to pay for themselves.

Activity 1: Measuring Air Pollution

Proficiency/Indicator:

Science

Use data gathering and organization skills to identify and investigate questions and assumptions.

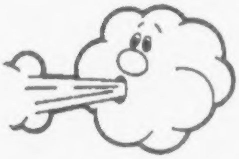
Apply communication skills to exchange self-generated and acquired knowledge.

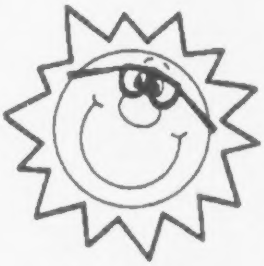
Materials: Four index cards per student, area map, petroleum jelly.

Directions:

1. Label the cards with the day's date and weather conditions, i.e., wind conditions, barometric pressure, precipitation. Coat one side of four index cards with petroleum jelly.
2. Take the cards home and place them outside around the house. Leave the cards for three days. Document the weather changes during the three days on a separate piece of paper. Bring the cards to class.
3. Observe the cards and discuss how the weather and the location of the cards within the community affect the outcome or residue left on the cards. Hypothesize the sources of pollution.
4. Shade a city map to indicate the various degrees of pollution found in the different areas of your city.

Hint: To avoid a mess, put cards together in sandwich fashion when taking them home – but **not** when returning them to school.





Producing glass from recycled material reduces related air pollution by 20 percent, water pollution by 50 percent.

Activity 2: Up in Smoke

Proficiency/Indicator:

Mathematics

Acquire skills necessary to perform routine manipulations.

Acquire skills in visualizing and interpreting mathematical relationships and communicating these ideas.

Materials:

A three pound coffee can with several holes for ventilation about an inch from the bottom, fine mesh screen for "lid," five 10 cm x 10 cm square pieces of cardboard, masking tape, matches, ruler, 500 ml beaker, scales, items to be burned, i.e., paper, egg shells, orange rinds, napkins, food scraps, three glass marbles, two nails

Directions:

1. Discuss with the students what incineration means.
2. Predict what will burn and what won't.
3. Tape the cardboard sections together to form a box 10 cm x 10 cm x 10 cm and fill it to the top with the trash materials listed above. (No plastics – plastics burn well in state-of-the-art incinerators but should not be burned in the open.)
4. Weigh and calculate the volume of waste ($V = L \times W \times H$). Initial volume will be 10 cm x 10 cm x 10 cm = 1000cc or one liter.
5. Place the trash from the box into the can and ignite trash. Cover the container immediately with screening to keep ashes from escaping. **Do this outside or under a ventilation hood.** Observe.
6. Place the cooled ashes back into the box. Weigh and calculate the volume of ash remaining using the same formula with the new weight or use a beaker/graduated cylinder. Survey what burned and what didn't.
7. Calculate the difference in the volume and the weight of trash before and after the burning process.
8. Discuss the possible benefits and problems of incineration.

Activity 3: How Does Your Garden Grow

Proficiency/Indicator:

Science

Demonstrate competence and confidence in applying the knowledge, processes, and attitudes of science in making informed decisions.

Use the major ideas of science in rational, creative thinking.

Materials:

Ten gallon aquarium or similar container, yard waste (grass, leaves, twigs, etc.) enough to fill the aquarium one-half to two-thirds full, soil (not potting soil), a large spoon, ruler or yardstick, a thermometer, water.

Time Needed:

This activity takes three weeks or longer.

Instruct students to do the following.

Directions:

1. Place clippings in aquarium loosely. Make sure there is enough air to help the decomposition process. Add water as needed to keep material moist.
2. Write a hypothesis at the beginning of this activity to predict the outcome.
3. Record initial and periodic observations in a journal, i.e., color, smell, height, temperature.
4. Discuss the findings at the end of the activity.
5. Empty the container in an appropriate place outside.
6. Write a conclusion summarizing the changes observed.
7. Compare each hypotheses to each conclusion.

When Halloween is over, compost your pumpkin shell.

Activity 4: Know Your ABCs

Proficiency/Indicator:

Language Arts Understand and experience the ways in which literature enriches life.

Fine Arts Express themselves through the arts by organizing and creating.

Materials: Scrap paper

Directions:

1. Write and illustrate an “ABCs of Recycling” book. Use scrap paper or paper grocery sacks for the cover.
2. Read the books to a primary class.
3. Discuss with the primary class other options for some of the letters.

Extended Activity: Judge each book’s cover in a competition.

Activity 5: That's a Rap

Proficiency/Indicator:

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Paper, pencil, markers, cassette tape, and cassette recorder.

Directions:

1. Divide the class into small groups.
2. Create a name for your rap group and compose a recycling rap.
3. Record the rap on tape while performing it for the class.

Extended Activities: Design a compact disc or record album cover for your rap. The cover should include an environmental message.

Produce an RTV (Recycling Television Video) and present it to the class.

> *Every year, Americans use almost 23,000 square miles of toilet paper. Next time you shop for toilet paper, buy brands that are made from recycled paper. Encourage your local grocery to stock them.*

Activity 6: Dig It!

Proficiency/Indicator:

Language Arts Appreciate and understand the written language and its relationships to culture and human experience.

Fine Arts Express themselves through the arts by organizing, creating, and performing.

Materials: Pen, paper.

Directions:

1. Divide the class into small groups and direct them to research the tools/products and the methods of waste disposal from three time periods. (Example: Cavemen Times, Medieval Times, and Modern Times.)
2. Compose a play with three acts – one for each time period.
3. Choose an artifact which would survive intact during these time periods (e.g., arrowhead, clay pot). This artifact should appear in all three scenes.
4. Each group should perform its play for a select audience.

Put your money where your mouth is. Cash contribution to environmental groups is badly needed. According to the Wall Street Journal, environmental causes receive less than one percent of all charitable giving in the United States. Americans produce 195.7 million tons of MSW (Municipal Solid Waste) annually. At least half of this garbage/trash is recyclable.

Activity 7: Garbage Game

Proficiency/Indicator:

Social Studies Analyze current issues and hypothesize about their impact upon the present and the future.

Science Apply communication skills to exchange self-generated and acquired knowledge.

Materials: Paper, pencils

Scoring: Two points for correct answers, zero for incorrect answers

Directions:

1. Divide the class into small groups.
2. Using class materials and outside resources, generate a list of 20 to 30 recycling questions and answers. The teacher should also generate questions of varying levels.
3. Divide the class into two teams. Choose a time limit for responses and for the length of the game.
4. Using the generated questions, one student will respond. If the first student does not give the correct response, the question passes to a student on the other team. If the correct answer is still not given, the first team may then discuss it as a group for an answer. The second team may also use group discussion for the last chance at the question.
5. Ask both teams to wager points for the final question (teacher generated). If they wager two points and answer correctly, it is added to their score.

TIME TO RECYCLE
COLA

Extended Activity: Present the game in a television show format with a host/hostess with recycling commercials.

To avoid some of the toxic chemicals used to clean bathrooms, try coating shower doors and tile walls with lemon oil. This will prevent soap scum from accumulating, and you can keep ammonia and chlorine out of the drain.

Activity 8: Recycled Times

Proficiency/Indicator:

Language Arts Develop written processes for the purpose of comprehending, engaging, and using written language.

Materials: Paper, pencils, scissors, glue stick, cardboard or poster board, and printing/copying facilities

Time Needed: One to four weeks depending on length of newspaper.

Directions:

1. Discuss and review the purpose of a newspaper with the class. You may want to ask a local newspaper editor to speak to your class.
2. Divide the class into the following teams: editorial team (writers and researchers), art team (illustrators, photographers, and/or picture collectors), production team (design banner and manage layout and printing), and advertising team (sell/create ads).
3. Devise story lines, i.e., feature story, comic strip/cartoons, crossword puzzles, interview or advice column, letters-to-the-editor, photographs, etc., and assign tasks and deadlines.
4. Completed elements should be submitted to the production team for design, layout, and printing.
5. Print on white recycled paper if possible and devise a method to collect the papers for recycling after they have been read.
6. Distribute school-wide or as an insert to the local newspaper.

Spread the word. Set up a special environmental bulletin board and post notices with interesting tidbits and statistics about the state of the Earth.

Activity 10: Public Service Announcement

Proficiency/Indicator:

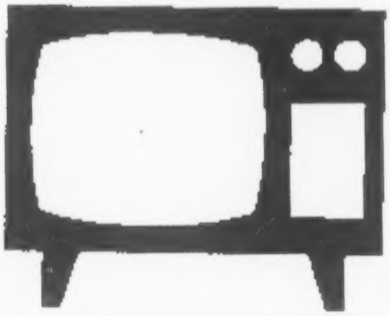
Language Arts Know the role the arts have played and continue to play in the life of humans.

Materials: Paper, pencils, tape recorder, camcorder, video/audio cassette tapes.

Directions:

1. Divide the class into groups.
2. Explain that each group will write and record a radio or television commercial to teach and promote recycling to its peers.
3. Explain that students can get their messages across in many creative ways: using sound effects and music, multiple voices, impersonations, person-on-the-street interviews, etc.
4. Give students time to discuss what they will do and to prepare their commercials. They may need time to gather items that they'll use in recording.
5. Rehearse and record the commercials. Present them to the class, to their families, or to the school.

Extended Activity: Contact local news media, radio, and television stations about using students' final products as public service announcements or commercials.



Teenagers: Organize an environmental club at school. Possible projects include working in support of a school recycling program, sponsoring cleanup days at parks or streams, and organizing tree planting. With a little imagination, you can have fun and show your parents how it's done.

Activity 10: Recycled Math

Proficiency/Indicator:

Mathematics

Develop a conceptual framework of mathematical ideas expressed as numbers, words, symbols, and figures.

Acquire skills necessary to utilize technology as a part of the mathematical process.

Materials: Pencil, paper, recycled math handout in Appendix A.

Directions:

1. Duplicate the recycled math handout in Appendix A and distribute to the class. Allow students to work in groups of two to calculate answers.
2. Discuss the answers as a class.

Extended Activity: Have students create their own recycled math problems.

APRIL
?
APRIL
3.5 Pounds

We toss out 18 billion disposable diapers every year – enough to stretch to the moon and back seven times.

Activity 11: Create Your Own Activity

Proficiency/Indicator:

To be decided by students.

Materials: To be decided by students.

Directions:

1. Divide the class into small groups.
2. Recommend that each group develop an original recycling activity. The activity may be used in class or recommended to another class.

Extended Activities: Compile class activities into a booklet to be used the following school year, or to be passed on to another grade level.

Send a copy of the booklet to:

Marty Alenduff, Recycling Coordinator
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798

RECYCLE
glass
Paper
Cans

Many manufacturers give away used wooden storage pallets for rough lumber; you can use it for basement shelving, sawhorses, and the like. If you burn wood, you may be able to use it for fuel. Either way, you reduce the need to cut new lumber.

APPENDICES

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American Lifestyles Research Graph

(Fourth Grade—Activity 1)

	Early Native American	Pioneers	People of Today
Clothing			
Food			
Shelter			
Water			
Hygiene			

Water Watchers

Monitor's Recording Sheet
(Fifth Grade – Activity 6)

Name: ______________________ Date: ______________________

First
Recording Time ________________ Meter Reading ________________

Final
Recording Time ________________ Meter Reading ________________

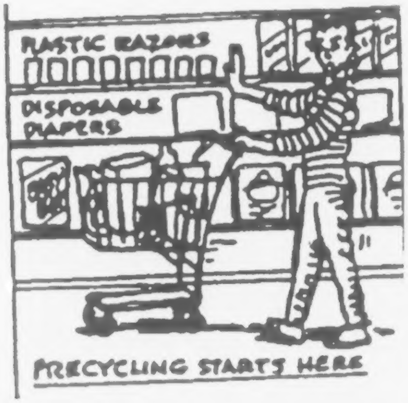
Lapsed Time ________________ Difference in Meter Readings ________

Comments and conclusions concerning the changes in meter readings:

Waste Chart

(Sixth Grade—Activity 2)

U.S. Municipal Waste		Household Waste
40%	Paper	50%
7%	Food Wastes	10%
18%	Yard Wastes	15%
8%	Plastics	2%
7%	Glass	8%
9%	Metals	7%
11%	Rubber/Textiles/Miscellaneous	8%


PLASTIC RAZORS
DISPOSABLE DIAPERS
PRECYCLING STARTS HERE

Fact Sheet

(Sixth Grade – Activity 2)

- Call a zoo or your local library and find out how much an average full-grown elephant weighs.
- Weigh a glass pop bottle. How many bottles does it take to equal one pound?
- Multiply the weight of the elephant (pounds) by the number of pop bottles in a pound. This is the number of pop bottles it would take to equal one elephant.
- Discover the number of people in your community and the number of people in your state. Multiply each number by 365.
- Divide each number by the number of pop bottles equal to one elephant. You are ready to make this statement:

If every person in _______(your city)___________ recycled one pop bottle per day for one year, the total weight of the pop bottles recycled would be equal to ______________ full-grown elephants!

(A)	Weight of an average elephant	______________
(B)	Weight of pop bottle	______________
(C)	1 pound divided by the weight of a pop bottle	______________
(D)	Weight of elephant (x) number of pop bottles/pound	______________
(E)	Number of people in my community (x) 365	______________
(F)	Number of people in my state (x) 365	______________
(G)	"E" or "F"divided by (D) =	______________ full-grown elephants!

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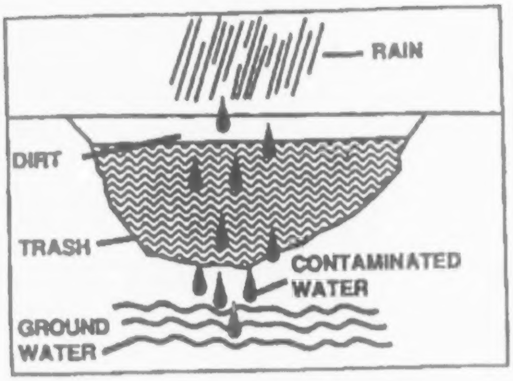
Making Choices "Sample Matrix"

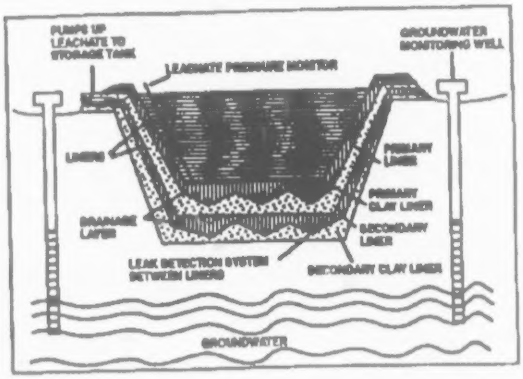
(Sixth Grade – Activity 3)

Source	Reduction	Reuse	Recycle	Compost	Incinerator	Landfill
Milk Jug	Yes	No	Yes	No	Yes	Yes
Tin Can	Yes	No	Yes	No	No	Yes
Bottle	Yes	Yes	Yes	No	No	Yes

OLD LANDFILL


RAIN
DIRT
TRASH
CONTAMINATED WATER
GROUND WATER

NEW LANDFILL


PUMPS UP LEACHATE TO STORAGE TANK
GROUNDWATER MONITORING WELL
LEACHATE PRESSURE MONITOR
LINERS
PRIMARY LINER
PRIMARY CLAY LINER
DRAINAGE LAYER
SECONDARY LINER
LEAK DETECTION SYSTEM BETWEEN LINERS
SECONDARY CLAY LINER
GROUNDWATER

Make It Rot – Data Table

(Sixth Grade – Activity 4)

Name ______________________ Date ______________________

Record your information below.

Bag	Initial Observations	First Week Observations	Second Week Observations	Prediction or Hypothesis
Cotton Cloth				
Pencil stub				
Leaves				
Cracker				
Notebook Paper				
Newspaper				
Glass				
Cardborad				
Banana Peel				
Bread				
Plastic Wrap				
Aluminum Foil				
Polystyrene pellets				
Disposable Diaper				
Soda Can				

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Banana Breakdown "Variable Chart"

(Sixth Grade – Activity 5)

Name ______________________ Date ______________________

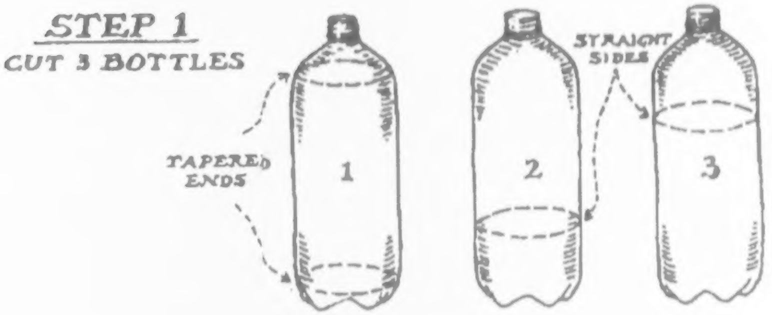
Bag	Initial Observations	First Week Observations	Second Week Observations
1			
2			
3			
4			
5			

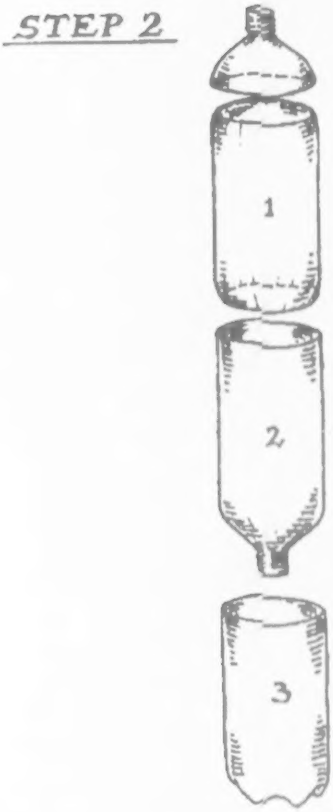
Pile It On! – Handout 2

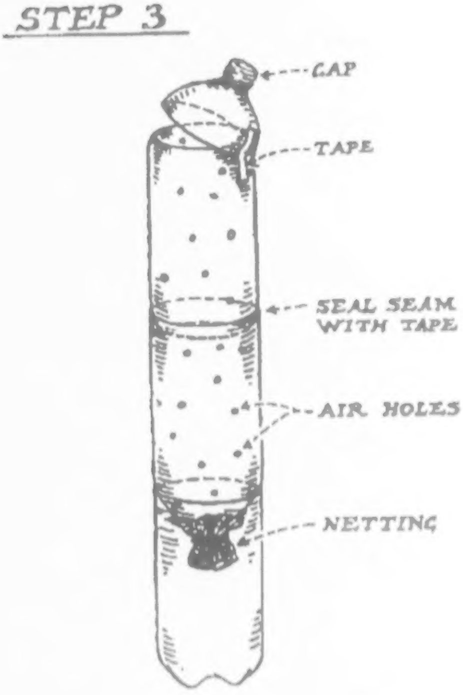
(Sixth Grade – Activity 7)

Name ______________________________ Date ______________________________

THREE-BOTTLE COMPOSTER


STEP 1
CUT 3 BOTTLES
TAPERED ENDS
STRAIGHT SIDES
1
2
3




STEP 3
CAP
TAPE
SEAL SEAM WITH TAPE
AIR HOLES
NETTING

Pile It On! – Handout 2

(Sixth Grade – Activity 7)

Name ______________________ Date ______________________

Symptoms	Problem	Solution
Compost has bad odor	Not enough air	Turn it.
Center of pile is dry	Not enough water	Moisten materials while turning pile
Compost is damp and warm in middle but nowhere else	Too small	Collect more material and mix the old ingredients into a new pile
Heap is damp and sweet-smelling but still will not heat up	Lack of nitrogen	Mix in nitrogen source like fresh grass clippings, fresh manure, bloodmeal, or ammonium sulfate

Do Use	Don't Use	Use With Caution
Wood ashes	Grass treated with chemical pesticides	Black walnut
Kitchen scraps (egg shells, coffee grounds, peelings, etc.)	Fish or meat scraps	Red cedar
Manure	Diseased vegetables	Sycamore
Top Soil	Weed seeds	Eucalyptus trees
Fallen Fruit	Manure from dogs/cats	
Saw Dust	Unfinshed compost on plants	
Sod	Charcoal and ash	

CURBSIDE RECYCLING

Sink Or Swim "Data Sheet"

(Sixth Grade – Activity 8)

Name ______________________ Date ______________________

Fill in the data below.

Sample	What It Looks Like	Will It Bend?	Will It Float In Sugar Water?		Will It Float In Alcohol Water?		Kind of Plastic
			Prediction	Actual	Prediction	Actual	
A							
B							
C							
D							
E							

Refer to the following chart to determine what type of plastic it is:

What It Looks Like	Will It Bend?	Will It Float In Sugar Water	Will It Float In Alcohol Water?	Kind of Plastic
Opaque; Waxy	Stiff, But Will Bend A Little	Yes	Yes	HDPE High Density Polyethylene
White; Shiny or Hard Waxy	Yes, It Bends Back to Original Position	Yes	Yes	PP Polypropylene
Clear Waxy	Bends	No	No	PET Polyethylene Terephthalate
Like Leather	Curls and Bends Back	No	No	PVC Polyvinylchloride
Crystalline; Like Glass	Bends But Cracks	Yes	No	PS Polystyrene

Plastics Coding System

1: PETE (polyethylene terephthalate)
2: HDPE (high density polyethylene)
3: V (vinyl)
4: LDPE (low density polyethylene)
5: PP (polypropylene)
6: PS (polystyrene)
7: Other

♳ PETE
♴ HDPE
♵ V
♶ LDPE
♷ PP
♸ PS
♹ OTHER

In for a Penny, In for a Pound Worksheet

(Sixth Grade – Activity 9)

Material	Value Per Pound
Glass	1 cent
Plastic	6 cents
Aluminum	40 cents

1. How much money would you earn if you brought one pound of empty plastic bottles and one pound of aluminum cans to a pay recycling center?
2. How much money would you earn if you brought one pound of each material?
3. How much money would you earn if you brought two pounds of each kind of material?
4. You collected one pound of aluminum cans and one pound of glass bottles and brought them to the recycling center. How much money would you earn? If you stopped at the store on the way home, how much more money would you need to buy a drink that costs $.50?

5 Suppose you knew that you had collected enough glass, plastic bottles, and aluminum cans to earn $10 at the recycling center. You plan to spend this money at a carnival. On the way to turn in the recyclables, you run into a friend and invite him or her to come with you to the recycling center and the carnival, but your friend has no money. So you give your pal 12 pounds of aluminum cans, so he or she can get some money. How much money would your friend be able to spend at the carnival? How much money would you get from the recycling center after you give away the cans?

6. If you collected enough plastic bottles to equal your weight, how much money would they be worth at the recycling center? How about aluminum cans? Glass bottles? (**NOTE:** If you don't know your weight, assume you weigh 80 pounds.)

Answers

1. 46 cents
2. 47 cents
3. 94 cents
4. 41 cents; 9 cents
5. $4.80; $5.20

To Recycle or Not To Recycle – Chart

(Seventh Grade – Activity 15)

Chart One

Type of Container	BTUs used per ounce	Size of Container	Calculate the number of BTUs used per 16 oz container
Glass All recycled ingredients	164	16	
No recycled ingredients	383	16	
Aluminum All recycled ingredients	125	16	
No recycled ingredients	391	16	
Plastic All recycled ingredients	117	16	
No recycled ingredients	164	16	

- NOTE: First weigh each empty container.

To Recycle Or Not To Recycle – Answer Key

(Seventh Grade – Activity 15)
Chart

Step 1

Type of Container	BTUs used per ounce	Size of Container	BTUs used per 16 oz container
Glass All recycled ingredients	164	(164 x 16)	2,625
No recycled ingredients	383	(383 x16)	6,128
Aluminum All recycled ingredients	125	(125 x 16)	2,000
No recycled ingredients	391	(391 x 16)	6,250
Plastic All recycled ingredients	117	(117 x 16)	1,872
No recycled ingredients	164	(164 x 16)	2,625

Type of Container	BTUs used for 100 containers of all recycled ingredients	BTUs used for 100 containers of all new ingredients
Glass	262,500 (2,625 x 100)	612,800 (6,128 x 100)
Aluminum	200,000 (2,000 x 100)	625,000 (6,250 x100)
Plastic	187,200 (1,872 x 100)	252,500 (2,525 x 100)

Glass Equations

1 31,500 – 12 recycled bottles (12 x 2,625)
+ 539,264 – 88 bottles of nonrecycled materials (88 x 6,128)
570,764 – Total BTUs

2. 131,250 – (50x2,625)
+ 306,400 – (50 x 6,128)
437,650 – Total BTUs

3. **133,114 – BTUs saved**

To Recycle Or Not To Recycle Continued

(Seventh Grade – Activity 15)

Aluminum Equations

1. 110,000 – (55 x 2,000)
+ 281,250 –(45 x 6,250)
391,250 – Total BTUs

2. 170,000 – (85 x 2,000)
+ 93,750 –(15 x 6,250)
263,750 – Total BTUs

3. **127,500 – BTUs saved**

Plastic Equations

1. 37,440 – (20 x 1,872)
+ 210,000 –(80 x 2,625)
247,440 – Total BTUs

2. 93,600 – (50 x 1,872
+ 131,250 –(50 x 2,625)
224,850 – Total BTUs

3. **22,590 – BTUs saved**

Recycled Math

(Eighth Grade – Activity 10)

1. If we throw away 3.5 pounds of garbage every day, how many kilograms do we throw away in a week?

2. If your family recycles 11 kilograms of aluminum cans in a month, how many pounds of cans do you recycle in a year?

3. By recycling one ton of newspapers, you are preserving about 3 cubic yards of landfill space, or a box 3 feet by 3 feet by 9 feet. How much space are you preserving in meters?

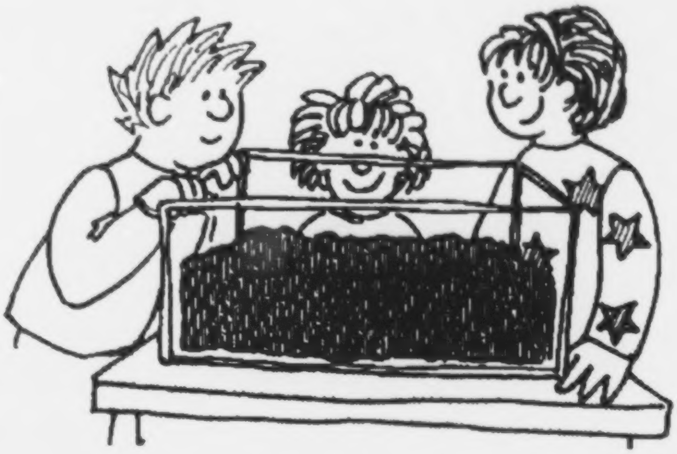
4. The Recycling Center is one kilometer from your home. You can only carry ten pounds that far or you'll have to take your bicycle. You have six kilograms of recyclables. How many pounds or recyclables do you have and how many will you get to the Recycling Center?

5. What's the fastest way to get to the neighborhood paper drive taking place at your school? Past Michael's house, which totals one kilometer from your house to school, or past Jennifer's, which is a one–mile trip from your house to school?

6. How much do you weigh in kilograms? In pounds?

7. In the United States, each of us generates 117 pounds of plastic trash per year. How many kilograms of plastic trash does each of us produce?

8. Of the 14,400,000 tons of plastic trash generated, 200,000 pounds is recycled each year, how many kilograms are generated? How many kilograms are recycled?



APPENDIX B Glossary of Terms

This glossary is provided for general educational purposes, and in some cases, to define terms used in the text of this application.

Acid Rain — Sulphur and nitrogen oxides, pollutants released by coal-burning electric-power plant or motor vehicles, are spewed into the atmosphere. There they are changed chemically into sulfuric acid and nitric acid .... They mix with water in rain clouds, and then they fall back to earth as acidified rain, snow, hail, etc.

Air — The mixture of gases that is all around the earth. Air cannot be seen, but it can spread to fill a space, and it can move in currents. It consists mainly of nitrogen and oxygen, but also, contains hydrogen, carbon dioxide, and other gases.

Aluminum — A silvery, lightweight metal that is a chemical element. It does not rust.

Appliances — Devices especially operated by electricity and designed for household use.

Ashfill — A specially constructed landfill to be used only for disposing waste-to-energy plants.

Bacteria — Single-celled living organisms that can cause disease; they also can break down solid waste.

Bauxite — The principal ore of aluminum.

Binoculars — A pair of small telescopes fastened together for use with both eyes.

Biodegradable — 1. The process by which a nonhazardous residue is produced when a material is acted upon by biological degradation, photochemical degradation, or chemodegradation. 2. Capable of being decomposed by biological processes.

BTU — British Thermal Unit. A measurement of the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit.

Buy Back Center — Any operation which accepts sorted recyclable materials and pays the party current market value per pound for the delivered material. (See Drop-Off Center)

Campaign — An operation undertaken to attain some political, social, or commercial goal.

Carbon Dioxide — (CO_2) A colorless, odorless, noncombustible gas made of carbon and oxygen molecules, which animals exhale when they breathe. Plants use this chemical in photosynthesis.

Cell — The area in a landfill where several layers of solid waste are deposited each day. At the end of the day, the layers are covered with soil and a cell is formed. Cells are built side by side and on top of one another until the landfill is completely filled.

Census — An official enumeration of population.

Ceremony — A formal act performed as prescribed by ritual or custom.

CFCs – CFC is shorthand for "chlorofluorocarbon, a man-made chemical consisting of chlorine, fluorine, and carbon atoms. Because CFCs are relatively nontoxic at ground level, we use them in many ways.

Collage – An artistic composition of materials and objects pasted over a surface.

Combustible – Capable of starting a fire.

Commercial Solid Waste – The waste from business.

Composting – An oxygen dependent degradation process by which plant and other organic wastes decompose, under controlled conditions, to produce a product with fertilizing and soil conditioning value.

Computer Printout – Computer paper, white or with bright green bars.

Condensation – The physical process by which a liquid is removed from a vapor or vapor mixture.

Conserve – To protect from loss or depletion. Conservation is the wise use of natural resources to minimize loss and waste.

Contaminate – To make impure or not clean.

Contract – An agreement between two or more parties.

Corrugated Cardboard – Unbleached, unwaxed kraft paper, with ruffled inner liner. Does not include linerboard or paperboard, such as cereal boxes or clothing liners.

Cullet – Scrap glass that has been broken into tiny pieces.

Curbside Recycling Program – The process of separating recyclables to be picked up at our homes by a recycling truck. Many cities and communities now have curbside recycling programs.

Decompose – To break down into component parts or basic elements; to rot. Decomposition is imperative for the continuation of life, since it makes essential nutrients available for use by plants and animals.

DEM – The Department of Environmental Management is a state agency responsible for environmental issues. DEM develops the recycling regulations and works with the Solid Waste Management Corporation to provide a Technical Assistance Program for those to whom the regulations apply.

Disposable – Designed for the convenient purpose of throwing out or away after short–term use.

Drop-Off Center – Any operation which accepts sorted, recyclable materials, but does not pay the party for the materials. (See Buy-Back Center)

Dump – Open, unsanitary disposal site used before existence of licensed, controlled burial sanitary landfills.

Ecology – The science dealing with the relations between all living things and the conditions that surround them.

Energy – The power of certain forces in nature to work. Resources, such as coal, oil, or gas used to produce such power. Also, the supply of such resources that can be obtained.

Energy Recovery – The generation of energy by burning solid waste.

Environment – The things that surround anything; especially, all the conditions that surround a person, animal, or plant and affect growth, actions, character, etc.

Environmentalist – A person who works to protect the conditions of living things, as by controlling pollution and the careless use of natural resources.

Environmentally Friendly/Environmentally Safe – There is no true definition. Nothing is completely "environmentally safe."

Evaporation – To convert or change into vapor.

Factitious – Produced artificially rather than by natural process.

Feldspar – Any porous substance through which a liquid or gas is passed in order to remove contaminates such as suspended matter.

Filter – Any porous substance through which a liquid or gas is passed in order to remove contaminants such as suspended matter.

Funnel – A cone shaped utensil with a small hole at the end used to channel a substance into a small-mouthed container.

Garbage – Spoiled or waste food that is thrown away. Generally defined as wet food waste; excludes dry material (trash). The term is often used interchangeably with the word "trash."

Glass – A transparent, inorganic material produced by melting almost pure silica sand with burnt lime or limestone and soda ash, which gives hardness and chemical durability.

Glassphalt – A paving material that is very similar to asphalt. It is made of petroleum and cullet, rather than petroleum and gravel.

Grades – (Not the ones in school.) A term used to level different quality-types of the same materials. For example, newspaper is a different grade of paper than stationery paper. Each grade is recycled seperately.

Graph – A chart or diagram showing the changes taking place in something, by the use of connected lines, a curve, etc.

Groundwater – Water beneath the earth's surface that fills the spaces and moves between soil particles and rock. Supplies wells and springs.

Habitat – The place where an animal or plant is normally found.

Hauler – A garbage collection company which offers complete refuse removal services. Many haulers now offer to serve as collectors of recyclables.

Hazardous Waste — Waste that causes special problems for living organisms or the environment because it is poisonous, explosive, burns or dissolves flesh or metal, ignites easily with or without flame, or carries disease. Some hazardous wastes cause only one problem, others cause several.

HDPE (High Density Polyethylene) — A recyclable plastic used for items, such as milk containers, detergent containers, and base cups for plastic soda bottles.

Helium — A colorless, odorless, tasteless inert gaseous element used to inflate and to provide lift for balloons.

High-Grade Paper — Relatively valuable types of paper, such as computer printout, laser printout, white ledger, and tab cards.

Household Hazardous Wastes — Wastes found around the house that can harm people or the environment because of their chemical makeup. Examples of household hazardous wastes include paint and paint cans, chemicals, medicines, and inorganic cleaning supplies. Because of their hazardous nature, they should be stored properly and disposed of separately from the rest of household trash.

Humus — Organic material consisting of decayed vegetable matter that provides nutrients for plants and increases the ability of the soil to retain water.

Impermeable — Not capable of allowing a liquid to spread or flow through. Something that is impermeable will not absorb water, for example.

Incinerator — A building where garbage and other waste materials are burned to create a smaller amount of solid waste in the form of ash.

Industrial — Having to do with industries.

Industrial Solid Waste — The waste from industries.

In-House — Programs which are limited to a specific building or set of buildings and do not involve the surrounding neighborhood or the greater community.

Inorganic — Things that are not made from plants and animals, and do not contain the element carbon. For example, chlorine used in pools and ammonia cleaners. (See organic)

Junk Mail — Unsolicited commercial mail.

Landfill — A site for the controlled burial of solid waste.

Laser Paper — Printouts from a laser printer.

Leachate — Liquid that has drained through solid waste and/or generated by solid waste decomposition and contains extracted, dissolved, or suspended materials. May contaminate groundwater or surface water.

Listed Material — Materials which businesses are required to recycle by law.

Litter — Waste materials discarded in an inappropriate place. Littering is illegal in Indiana.

Low-Grade Paper – Less valuable types of paper, such as mixed office paper, corrugated cardboard, and newspaper.

Magnet – Any piece of iron, steel, or lodestone that has the natural power to draw iron and steel to it. This power may also be given artificially by passing an electric current through wire wrapped around the metal.

Magnify – To make an object look or seem larger or greater than it really is.

Market Creation Activities – Any series of activities which has as its goal the profitable sale of recyclable materials at their highest possible price. These activities include any which are common in the field of business. They may include the acts of collection, processing, transportation, and/or multi-party cooperative efforts.

Methane – A colorless, odorless, flammable, potentially dangerous gaseous hydrocarbon (CH_4) present in natural gas and formed by the decomposition of organic matter. Can be used as a fuel.

Microorganism – Microscopic living things involved in the composting of wastes and in sewage treatment processes.

Mineral – An inorganic substance found in nature. Gold, silver, and iron ore are minerals.

Mixed Office Paper – Paper which is unsegregated by color or quantity (e.g., combination of white ledger, newsprint, colored paper, envelopes without windows, etc.). Mixed paper generally sells below the price of the least valuable paper in the mix.

Monofill – Another term for ashfill.

Municipal Solid Waste – Solid waste produced in homes.

Natural Resource – Valuable, naturally occurring material, such as soil, wood, air, water, or minerals.

Nonrenewable Resource – A natural resource that, because of its scarcity, the great length of time it takes to form, or its rapid depletion is considered limited in amount (e.g., coal, copper, petroleum).

Office Paper – Used or discarded high grade white paper. This includes typing paper, photocopy paper, and other paper deemed acceptable by a used paper buyer.

Open Dump – An open disposal site. In the United States, open dumps are being phased out by the Environmental Protection Agency (EPA).

Organic – Simple, basic, and close to nature, pertaining to, or derived from living organisms.

Oxygenation – To treat, combine, or infuse with oxygen.

PET (Polyethylene Terephthalate) – A type of plastic resin. For example, two liter, plastic soda bottles are made of PET.

Photodegradable – Item decomposes when exposed to ultraviolet rays from the sun.

Pollution – Harmful substances deposited in the environment, leading to a state of dirtiness, impurity, or unhealthiness.

Post-Consumer Waste – Any product which has served its intended use or has exceeded its useful life and is diverted from the waste stream.

Processing – Any technique for the purpose of reducing the volume or bulk of waste and increasing its value or marketability.

Public Official – A person who serves the public, such as anyone elected or appointed to a position or work in government.

Rain Forest – Technically, a rain forest is a forest which receives four to eight meters of rain per year. Tropical rainforests are located in a narrow region near the equator in Africa, South and Central America, and Asia. They are the densest, most intricate, biologically richest—and most endangered—ecosystems on the planet. Although rainforests make up only 2 percent of the Earth's surface, over **half** the world's wild plant, animal, and insect species live in them.

Raw Material – Unprocessed natural resource or product used in manufacturing.

Recyclable – A material which can be recycled.

Recyclable Material – Any post-consumer waste for which a market currently exists or for which one could be developed.

Recycle – The collection and reprocessing of manufactured materials for reuse either in the same form or as part of a different product.

Recycled Content – Goods, supplies, equipment, materials, and printing containing post-consumer materials.

Recycled Paper – Any paper product which contains post-consumer material. (Some recycled paper contains preconsumer or in-plant scraps.)

Recycler – Someone who processes or buys recyclable materials on a regular basis.

Recycling – A closed-loop system which includes the separation, collection, processing, and the eventual resale or reuse of materials which would otherwise be disposed of as municipal waste.

Renewable Resource – A natural resource derived from an endless or cyclical source (e.g., sun, wind, water, wood, fish). With proper management and wise use, replacement of these resources by natural or human-assisted systems can be approximately equal to their consumption.

Resin – A natural, organic substance used to manufacture varnish, ink, and plastic.

Resource Recovery – The generation of energy from solid waste through combustion with extraction of some recyclable materials as a by-product.

Reuse – A process by which an item that has served its original intended purpose, serves some new purpose(s) without undergoing extensive reprocessing.

Sanitary Landfill – A specially engineered site for disposing of solid waste on land constructed in a way that reduces hazards to health and safety.

Scrap – Leftover material discarded as refuse.

Sewage – Liquid or solid waste which is carried off by sewers and purified in a sewage treatment plant.

Silt – A sedimentary material consisting of fine mineral particles.

Slurry – A thin mixture of water and fine substances, such as clay. In a landfill, a slurry wall prevents the movement of slurry beyond the landfill boundaries.

Soda Ash – A white material made from the mineral called sodium. Soda ash is used to make glass.

Soil – The upper layer of earth which may be dug.

Solid Waste – All solid and semisolid wastes, including trash, garbage, yard waste, ashes, industrial waste, swill, demolition and construction waste, and household discards such as appliances (white goods), furniture, and equipment.

Solid Waste Management – The controlling, handling, and disposal of all solid waste. One goal of solid waste management is to reduce waste to a minimum.

Solid Waste Stream – The cycle that solid waste goes through, from the creation of garbage and trash, to depositing waste in landfills and incinerators. The waste stream includes the recycling process.

Sorted Colored Ledger Paper – Sheets or cuttings of colored or white sulphite ledger paper. Colored paper also includes bond, writing, and other papers which have a similar fiber and filler content. Colored ledger paper must not be contaminated with treated, coated, padded, or heavily printed paper, carbon paper, or nonpaper materials.

Source Reduction – Increasing efficiency, substituting materials, or changing processes, so that fewer waste materials are produced.

Source Separated Materials – Materials which have been separated, according to their type, from the waste stream at their point of origin.

Source Separation – The separation of recyclable materials at the point of origin for the purpose of recycling.

Steel – A hard, tough metal made of iron mixed with a little carbon.

Styrofoam – A trademark for a light, resilient polystyrene plastic.

Suet – Hard fatty tissues around the kidneys of cattle and sheep.

Sump – The lowest area of a landfill into which leachate drains before being pumped out and treated at the landfill or at a sewage treatment plant.

SWMC — The Solid Waste Management Corporation operates all state-owned waste management facilities, including incinerators.

Tab Cards — Manilla computer cards. Must be separated by color, but valuable as a high grade paper. Different from computer printout.

Tinned Steel Container — A tin-coated steel container. They are widely used for canned goods, such as tuna fish and dog food.

Tipping Fee — The price individuals, communities, and trash hauling companies must pay a sanitary landfill operation to get rid of their trash or the trash they collect. The fee is called a tipping fee because truck drivers must unload by tipping up the back of the truck.

Topsoil — The top layer of soil containing valuable nutrients.

Trash — Material considered worthless, unnecessary, or offensive that is usually thrown away. Generally defined as dry waste material; excludes food waste (garbage) and ashes. The term is often used interchangeably with the word "garbage."

Vegetation -- Plants, trees, shrubs, grass, and the like.

Waste — Refers to unsegregated materials (both recyclable and nonrecyclable) generated as a by-product of an operation, and later disposed of. The term may be used to include materials which are recycled, as well.

Waste Reduction — The design, manufacture, and/or use of a product to minimize the weight or volume of waste materials generated.

Waste Stream — The sum total of all discarded materials.

Waste-to-Energy Plant — A process where energy, in the form of steam or electricity, is produced by burning solid waste, gases, or chemicals.

Water — The colorless liquid that falls as rain, is found in springs, rivers, lakes, and oceans, and forms a large part of the cells of all living things.

White Goods — Also referred to as white metals, white goods are household appliances.

White Ledger — White sulphite or sulphate ledger paper. Includes copy machine paper, letterhead, and white notebook paper.

Wood Fiber — A stringy substance made from wood. This substance makes paper feel the way it does. (This is called texture.) It also helps keep together the ingredients that make paper.

Wood Pulp — When wood fibers are combined, they are called pulp. They pulp is used to make paper and paperboard.

Yard Waste — Leaves, grass clippings, and other organic materials collected from lawns. Yard waste is used for compost materials.

Appendix C Environmental Resources

The array of information presented below on the environment is just a few of the hundreds of other sources. This listing is not meant to discourage those who have the means of supplementing this publication with others appropriate to their field of interest and geographic location.

Alliance of Environmental Educators
2111 Wilson Boulevard
Suite 701
Arlington, VA 22201

For a variety of environmental education curricula.

American Council for an Energy-Efficient Economy
1001 Connecticut Avenue, Northwest
Suite 535
Washington, DC 20036

Two booklets, entitled *The Most Energy Efficient Appliances* and *Saving Energy and Money with Home Appliances*. Each costs $3.

American Forestry Association
Global ReLeaf Program
P.O. Box 2000
Washington, DC 20013
(202) 667-3300

American Nature Study Society
5881 Cold Brook Road
Homer, NY 13077
(607) 749-3655

American Nature Study Society promotes environmental education through *Nature Study* magazine, meetings, workshops, and field trips.

American Plastics Council
1275 K Street, Northwest, Suite 400
Washington, DC 20005
(202) 317-5317

A-Way With Waste
Washington Department of Ecology
350 150th Avenue, Northeast
Redmond, WA 98052

A-Way with Waste curriculum guide about recycling for Grades K-12.

Biological Science Curriculum Study (BSCS)
The Colorado College
Colorado Springs, CO 80903
(303) 473-2233

Provides a variety of materials for teachers and students including textbooks, laboratory manuals, subject modules, and films.

Brian Budd, Inc.
Box 1307
3620 Stevenson Avenue
St. Charles, IL 60174-7304

Provides *Porter Recycling Manual* free to schools and colleges to assist officials in setting up recycling plans.

Bullfrog Films, Inc.
Oley, PA 19547

Rents films and videos with environmental themes.

California State Environmental Education Guide (1987)
Alameda County Office of Education
Library Department, EG
313 West Winton Avenue
Hayward, CA 94544-1198

Eight instructional units and six action projects (Grades K-6). ($17.95)

California Energy Extension Service – Energy Action in Schools
Governor's Office of Planning and Research
1400 10th Street, Room 209
Sacramento, CA 95814

Annotated bibliography of sample, energy education materials (Grades K-6 and Grades 7-12).

Celebration of the Outdoors
Suite 5001
250 24th Street, Northwest
Washington, DC 20037

This organization has an education poster and an outdoor resource survey for the students to rate their communities (Grades K-3).

Center for Marine Conservation
1725 DeSales Street, Northwest
Washington, DC 20036

Central States Glass Recycling Program
770 East 73rd Street
Indianapolis, IN 46240
(317) 251-0131

Citizen's Clearinghouse for Hazardous Waste
P.O. Box 926
Arlington, VA 22216

A grassroots organization founded by Love Canal Heroine Lois Gibbs; helps grassroots community groups organize against proposed or existing hazardous waste landfills, incinerator, etc.

Citizens for a Better Environment
33 East Congress
Suite 523
Chicago, IL 60605

Conservation and Renewable Energy Information Referral Service
(800) 523-2929

Public inquires and bibliographies on renewable and nonrenewable energy.

Co-Op America
Suite 403
2100 M Street, Northwest
Washington, DC 20063

Potpourri of earth, positive products.

Corporation and Public Broadcasting 1990 – Year of the Environment
Public Broadcasting System
Elementary and Secondary Service
1320 Braddock Place
Alexandria, VA 22314
(202) 955-5110

Council on Packaging in the Environment
1275 K Street, Northwest, Suite 400
Washington, DC 20005
(202) 317-5228

Environmental Resource Compendium ($10)

Defenders for Wildlife
1244 19th Street, Northwest
Washington, DC 20036

Earth Child
K-12 Peace Child International
3977 Chain Bridge Road
Fairfax, VA 22030
(703) 385-4494

A simple one-act play/musical designed to be a centerpiece for a two to four week mini-unit on the environment.

Earth Day Birthday Project
183 Pinehurst Avenue
New York, NY 10033
(212) 928-1463

The activities created by this organization are geared especially for the primary grades. They will be sponsoring an Earth Day Gift Program in which students can raise money to save acres of rainforests in Central America. Information about the program, which includes an eight-page teacher's guide, can be obtained by sending a self-addressed stamped envelope to the above address. Information is also available about an "Earth Day Children's Pledge" in which participating classes will send in their hand prints which will be displayed on a great image of the earth in New York City.

Earth Day 1990
U.S. (PM 211-B) Public Information Center
401 M Street, Southwest
Washington, DC 20460
(202) 475-7751

This agency offers a coloring book, *Once There Lived a Wicked Dragon*, which tells a story of the need to protect our environment and what the world would be like if we didn't (Grades K-3).

Earth Island Institute
300 BroadwaySuite 28
San Francisco, CA 94133

Earth Society Foundation
585 Fifth Avenue
New York, NY 10017
(718)574-3059

Ecology Center
1403 Addison Street
Berkeley, CA 94702
(415) 548-2220

Eco-Net Institute for Global Communication
3228 Sacramento Street
San Francisco, CA 94115
(415) 923-0900

An electronic network for environmental information.

Environmental Action
1525 New Hampshire, Northwest
Washington, DC 20036

Environmental Defense Fund
1616 P Street, Northwest, Suite 150
Washington, DC 20036

Environmental Literacy Group
33770 Woodland Drive
Evergreen, CO 80439
(818) 986-0755

Environmental Hazards Management Institute
Box 932, Department CM
Deerborn, NH 03824

Household hazardous wasteful charts, risks, alternating, and safe disposal methods.

Environmental Policy Institute
218 D Street, Southeast
Washington, DC 20003

EPA
Health Science Center for Texas Tech
Pesticide Hotline (800) 858-7378

Foodservice & Packaging Institute
1901 North Moore Street
Suite 1111
Arlington, VA 22209
(703) 527-7505

VHS video tape available, *Should I Feel Guilty?*

Free Spirit Press
400 First Avenue North
Suite 616
Minneapolis, MN 55401

The Kids' Guide to Social Action offers instruction on basic skills, including making phone calls and writing letters, and suggests ways to get up-to-date information and funding on ecology issues.

Friends of the Earth
530 Seventh Street, Southeast
Washington, DC 20003
(202) 543-4312

Garbage Magazine, The Practical Journal for the Environment
435 9th Street
Brooklyn, NY 11215-9937

Readable information magazine with tips, background history, and new products review. $29/year subscription.

The Green Consumer Letter
Department J1
526 Connecticut Avenue
Washington, DC 20036

Monthly newsletter that contains latest information on environmentally sound products and practices. For sample issue, send $2 to above address.

Greenpeace
1436 U Street, Northwest
Washington, DC 20009

Human Environment Center
Suite 827
1001 Connecticut Avenue, Northwest
Washington, DC 20036

Indiana Recycling Coalition
Tom Neltner
P.O. Box 20444
Indianapolis, IN 46220-0444
(317) 283-6226

Inform
381 Park Avenue South
New York, NY 10006

A quarterly magazine focusing on research and education concerning alternative fuels, solid waste and recycling, and hazardous wastes.

Institute for Earth Education "Earthkeepers"
P.O. Box 288
Warrenville, IL 60555

An educational program for helping young people live in harmony with the earth and other resources.

Izaak Walton League of America
1401 Wilson Boulevard
Level B
Arlington, VA 22209

Keep America Beautiful (KAB)
Mill River Plaza
Nine West Broad Street
Stanford, CT 06902
(203) 323-8987

Living Lightly in the City (Grades K-6)
Living Lightly on the Planet (Grades 7-12)
Schlitz Audubon Center
111 East Brown Deer Road
Milwaukee, WI 53217

Mail Preference Service
Direct Marketing Association
11 West 42nd Street
P.O. Box 3861
New York, NY 10163-3861

Conserve a tree and curtail junk mail. Write to the above address to be removed from junk mail listings.

Media Network
121 Fulton 5th Floor
New York, NY 10038
(212) 619-3455

Distributes environmental education films and videos and *Greenjems*, a guide listing available environmental films and videos. ($6.50 individuals, $9.50 institutions)

National Arbor Day Foundation
Arbor Lodge 100
Nebraska City, NE 68410

National Audubon Society
645 Pennsylvania Avenue, Southeast
Washington, DC 20003

National Coalition Against the Misuse of Pesticides
530 7th Street, Southeast
Washington, DC 20003
(202) 543-5450

National Geographic Kids Network
Dorothy Perreca, Project Manager
Kids Network, Educational Media Division
National Geographic Society
Washington, DC 20036
(202) 775-6580

National Geographic Society
Educational Services
Department 90
Washington, D.C. 20036

Two filmstrips about energy and pollution: "Challenges to a Healthy Environment" (Advanced) and "This World of Energy; II" (Intermediate and Advanced).

National Soft Drink Association
1101 16th St Northwest
Washington, DC 20036
(202) 463-6700

Information available on soft drink container recycling. Publications include A *National Directory of Solid Waste Curricula/Education Resources* and *Things You've Always Wanted to Know About Soft Drink Container Recycling.*

National Solid Wastes Management Association
Eugene J. Wingerter, Executive Director
1730 Rhode Island Ave., Northeast, Suite 1000
Washington, DC 20036
(202) 659-4613

National Technical Information Services (NTIF)
Springfield, VA 22161

Helps understanding of environmental issues. It covers superfund issues, greenhouse effect, pesticides, and more.

National Wildlife Federation
1412 16th Street, Northwest
Washington, DC 20036

The Natural Choice
1365 Rufina Circle
Santa Fe, NM 87501

Catalog available. Plant chemistry offers nontoxic alternative art materials, stains, paints, wood preservatives, etc.

Natural Resources Defense Council
40 West 20th Street
New York, NY 1011-4211
(212) 949-0049

Nature Conservancy
1815 North Lynn Street
Arlington, VA 22209
(703) 841-5300

Dedicated to preserving wilderness areas by buying it from private owners. They have purchased more than 3.5 million acres thus far.

Nature Conservatory International
1800 North Kent Street
Suite 800
Arlington, VA 22209

NROC Ozone Guide
40 West 20th Street
New York, NY 10011

Free list of 137 products ranging from carpet cleaner containing the ozone depleting chemical to many others.

Oceanic Society
218 D Street, Southeast
Washington, DC 20003

Oregon Department of Fish and Wildlife
P.O. Box 59
Portland, OR 97207

How-to booklet *Get the Drift and Bag It: A Nuts and Bolts Guide to Organizing a Beach Clean-Up Campaign the Easy Way.*

Outdoor Biology Instructional Strategies (OBIS)
Delta Education, Inc.
P.O. Box M
Nashua, NH 03061

Set of activity cards for Grades 4-9.

Project WILD
Warren Gartner
State Coordinator
6013 Lakeside Boulevard
Indianapolis, IN 46224
(317) 290-3223

A Grades K-12 interdisciplinary, wildlife education curriculum supplement.

Project Learning Tree (PLT)
Jan Josie
State PLT Coordinator
6013 Lakeside Boulevard
Indianapolis, IN 46224
(317) 290-3223

A Grades K-12 interdisciplinary natural resources education curriculum supplement.

Rainbow Child Program Grades K-6
1705 Balsam Lane
Villanova, PA 19085
(215) 525-4133

Earth awareness lesson plans and teacher training workshops.

Rainforest Action Network
300 Broadway Suite 28
San Francisco, CA 94133

Renew America
1001 Connecticut Avenue
Suite 1719
Washington, DC 20036

Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, CO 81654

Save the Planet Shareware
Box 45
Pitken, CO 81241

IBM compatible program unlinks global warning game, lists of environmental groups, recycling, energy saving suggestions, and more ideas to make life a little greener.

Science and Environmental Education Resource Guide, 1989
California State Department of Education
721 Capital Mall
Sacramento, CA 95814

A directory of national science and environmental education resources.

Sharing Nature with Children
Listening to Nature
Ananda Publications
14618 Tyler Foote Road
Nevada City, CA 95959
(916) 292-3225
(800) 843-5272

Sierra Club
703 Polk Street
San Francisco, CA 94109
(415) 776-2211

Provides teacher newsletter, list of environmental education materials, filmstrips, slides and videos, and a literature list for children.

Solar Electric Catalog
175 Cascade Court
Rohnert Park, CA 94928

Latest solar-powered products on the market.

Solid Waste Association of North America
8750 Georgia Avenue, Suite 123
Silver Springs, MD 20910
(301) 585-2898

Steel Can Recycling Institute
Foster Plaza X
680 Anderson Drive
Pittsburgh, PA 15220
(800) 876-7274

Teaching materials are available through this organization including a coloring book. New materials are being developed for various age groups but were not available in the spring of 1990. However, the organization can provide some very useful background information on this specific area of the recycling industry.

Toxics in My Home? You Bet!
Golden Empire Health Planning Center
2100 21st Street
Sacramento, CA 95818
(916) 731-5050

Curriculum units on household hazardous waste, Grades K-12.

Toxics: Taking Charge
Alameda County Office of Education
313 West Winton Avenue
Hayward, CA 94554-1198

Supplement to the California State Environmental Education Guide (Grades 4-6).

Trees for the Future
11306 Estona Drive
Box 1786
Silver Spring, MD 20915-1786
(301) 496-6531

Provides seeds for reforestation.

U.S. Environmental Protection Agency
Office of Community and Intergovernmental Relations
Mail Code A-108 EA
401 M Street, Southwest
Washington, DC 20460
(202) 382-4454

Directory of environmental education materials for Grades K-12.

Waste Watch
P.O. Box 39185
Washington, DC 20016
(202) 895-2601

Volunteers concerned with national resource waste problems. Promotes constructive citizen action and participation in waste issues. Seeks to enhance public information flow and education in resource and environmental issues.

Wellman, Inc.
Dennis Sabourin, Vice President
1040 Broad Street, Suite 302
Shrewsbury, NJ 07702
(201) 542-7300

A major United States plastics recycler, Wellman has a kit on recycled plastic which includes plastic materials at various stages of recycling and samples of the products made from it.

Wilderness Society
1400 I Street, Northwest
Washington, DC 20005
(202) 842-3400

Focuses exclusively on protecting the nation's public lands. The society lobbies to expand wilderness areas and ensure biological diversity. Programs include grassroots organizing, lobbying, research, and public education. The Wilderness Society issues an annual report and monthly magazine, as well as notices and alerts on critical issues.

Worldlink: Spaceship Earth: Our Global Environment
8755 West Colgate Avenue
Los Angeles, CA 90048
(213) 273-2636

First in series of video travels around the world to present segments on environmental problems and solutions. Hosted entirely by young people. Includes a teacher's guide.

World Resources Institute
1735 New York Avenue, Northwest
Washington, DC 20006

World Wildlife Fund
1250 24th Street, Northwest
Washington, DC 20037

Worldwatch Institute
1776 Massachusetts Avenue
Washington, DC 20036

Zero Population Growth
1400 16th Street, Northwest, Suite 320
Washington, DC 20460
(202) 382-4454

Zero-Population Growth – Teacher training programs and Grades K-12 curriculum.

Organizations to Write to for Information on the Ocean Crisis

American Cetacean Society
P.O. Box 2639
San Pedro, CA 90731
(213) 548-6279

Council on Ocean Law
1709 New York Avenue, Northwest, 7th Floor
Washington, DC 20006
(202) 347-3766

Defenders of Wildlife
1244 19th Street, Northwest
Washington, DC 20036
(202) 659-9510

Global Tomorrow Coalition
1325 G Street, Northwest, Suite 915
Washington, D.C. 20005-3104
(202) 628-4016

National Wildlife Federation
1400 16th Street, Northwest
Washington, D.C. 20036-2266
(202) 797-6800

Oceanic Alliance
Fort Mason Center, Building E
San Francisco, CA 94123
(415) 441-5970

Oceanic Society
218 D Street, Southeast
Washington, DC 20003
(202) 544-2600

Population-Environment Balance
1325 G Street, Northwest, Suite 1003
Washington, DC 20005
(202) 879-3000

World Resources Institute
1709 New York Avenue, Northwest, Suite 700
Washington, DC 20006
(202) 638-6300

Appendix D State Government Recycling Agencies

Alabama

Department of Environmental Management
State Capital
Montgomery, AL 36104
(205) 271-7700

Alaska

Department of Environmental Conservation
Pouch 0
Juneau, AK 99811
(907) 465-2666

Department of Environmental Conservation
Division of Quality
410 Willoughby Avenue Suite 105
Juneau, AK 99801-1795
(907) 465-5150

Arizona

Conservation Programs
Energy Office
1700 West Washington Street
Phoenix, AZ 85007
(502) 255-3303

Department of Environmental Quality/OWT
3033 North Central
Phoenix, AZ 85012
(602) 207-2381

Arkansas

Solid Waste Management Division
Department of Pollution Control and Ecology
8001 National Drive
Little Rock, AR 72219
(501) 562-7444

California

Recycling Division
Department of Conservation
819 19th Street
Sacramento, CA 95814
(916) 323-3508

Colorado

Land Pollution Control Section
Hazardous Materials and Waste Management Division
Department of Health
4210 East 11th Avenue
Denver, CO 80220
(303) 320-8333

Office of Energy Conservation
1675 Broadway, Suite 1300
Denver, CO 80202
(303) 620-4292

Connecticut

Department of Environment
Waste Management Bureau – Recycling Program
165 Capital Avenue
Hartford, CT 66016
(203) 566-8722

Solid Waste Management Unit
Department of Environmental Protection
State Office Building
Hartford, CT 06106
(203) 566-5847

Delaware

Department of Natural Resources and Environmental
Control/Solid Waste Branch
P.O. Box 1401 – 89 Kings Highway
Dover, DE 19903
(302) 739-5071

District of Columbia

District of Columbia Solid Waste Disposal
2730 South Capitol Southeast
Washington, DC 20032
(202) 767-8512

Florida

Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(904) 488-0300

Georgia

Department of Natural Resources
Solid Waste Management Program
4244 International Parkway, Suite 100
Atlanta, GA 30354
(404) 656-3898

Georgia Clean and Beautiful
40 Marietta Street, Northwest
8th Floor
Atlanta, GA 30303
(404) 656-3898

Hawaii

Department of Health
P.O. Box 3378
Honolulu, HI 96801
(808) 548-3400

Department of Health
Office of Solid Waste Management
Waterfront Plaza Suite 250
Honolulu, HI 96813
(808) 586-4226

Idaho

Department of Health and Welfare
State House
Boise, ID 83720
(208) 334-2789

Illinois

Department of Energy and Natural Resources
325 West Adams Street
Room 300
Springfield, IL 62704-1892
(217) 785-2800

Indiana

Office of Solid and Hazardous Waste Management
Indiana Department of Environmental Management
P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 232-8883

Iowa

Solid Waste Section
Department of Natural Resources
900 East Grand Avenue
Des Moines, IA 50319
(515) 281-3426

Kansas

Department of Health and Environment
Forbes Field
Topeka, KS 66620
(913) 296-1500

Kentucky

Resources Management Branch
Division of Waste Management
18 Reilly Road
Frankfort, KY 40601
(502) 564-6716

Louisiana

Solid Waste Division
Department of Environmental Quality
Box 44307
Baton Rouge, LA 70804

Maine

Department of Environmental Protection
Station 17, State House
Augusta, ME 04333
(207) 289-2111

Maryland

Department of Environment
Hazardous and Solid Waste Management Administration
2500 Broening Highway, Building 40
Baltimore, MD 21224
(301) 631-3305

Environmental Service
2020 Industrial Drive
Annapolis, MD 21401
(301) 974-3291

Massachusetts

Division of Solid Waste
Department of Environmental Quality Engineering
1 Water Street
Boston, MA 02108
(617) 292-5962

Michigan

Waste Management Division
Resource Recovery Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909
(517) 373-0540

Minnesota

Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155
(612) 296-8439

Mississippi

Department of Environmental Quality
Office of Pollution Control
P.O. Box 10385
Jackson, MS 39289-0385
(601) 961-5171

Nonhazardous Solid Waste Section
Department of Natural Resources
P.O. Box 10385
Jackson, MS 39209

Missouri

Waste Management Program
Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102
(314) 751-3176

Montana

Solid and Hazardous Waste Management Bureau
Department of Health and Environmental Science
Cogswell Building
Helena, MT 59620
(406) 444-2821

Nebraska

Department of Environmental Control
P.O. Box 94877
State Office Building
Linden, NE 68509
(402) 471-4210

Nevada

Office of Community Services
1100 East Williams Street
Carson City, NV 89710
(702) 885-4420

New Hampshire

Department of Environmental Services
Waste Management Division
6 Hozen Drive
Concord, NH 03301
(603) 271-2900

New Jersey

Office of Recycling
Department of Energy
101 Commerce Street
Newark, NJ 07102
(201) 648-1978

New Mexico

Solid Waste Bureau
1190 St. Francis Drive
Santa Fe, NM 87502
(505) 827-0197

Solid Waste Management
Health and Environment Department
P.O. Box 968
Santa Fe, NM 87504
(505) 827-2780

New York

Department of Environmental Conservation
Bureau of Recycling
50 Wolf Road
Albany, NY 12233
(518) 457-7336

North Carolina

Pollution Prevention Program
Department of Natural Resources
P.O. Box 27687
Raleigh, NC 27611
(919) 733-7015

North Dakota

Division of Waste Management Special Studies
Department of Health, Room 302
Bismarck, ND 58505
(701) 224-2366

Ohio

Division of Litter Control and Recycling
Department of Natural Resources
Fountain Square Court, F-2
Columbus, OH 43224
(614) 265-6353

Oklahoma

Solid Waste Division
State Department of Health
1000 Northeast 10th Street
Oklahoma City, OK 73152
(405) 271-7159

Oregon

Department of Environmental Quality
P.O. Box 1760
811 Southwest 6th Avenue
Portland, OR 97204
(503) 229-5826

Pennsylvania

Recycling and Energy Recovery Section
Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120
(717) 787-7382

Rhode Island

Environmental Management
83 Park Street
Providence, RI 02903
(401) 277-3434

South Carolina

Bureau of Solid and Hazardous Waste Management
Department of Health and Environmental Control
2600 Bull Street
Columbus, SC 29201
(803) 758-5681

South Dakota

Alternative Energy Programs
Office of Solid Waste Management
State Capitol Building
Pierre, SD 57501
(605) 773-3153

Tennessee

Division of Solid Waste Management
Department of Health and Environment
701 Broadway, 4th Floor
Nashville, TN 37219-5403
(615) 741-3424

Texas

Division of Solid Waste Management
Department of Health
1100 West 49th T-610A
Austin, TX 78756-3199
(512) 458-7271

Texas Water Commission
Municipal Solid Waste Division
P.O. Box 13087
Austin, TX 78711
(512) 834-6682

Utah

Department of Environmental Quality
Division of Solid and Hazardous Waste
P.O. Box 144880
Salt Lake City, UT 84114-4880
(801) 538-6170

State Recycling Program
150 West North Temple Street
P.O. Box 2500
Salt Lake City, UT 84110
(801) 538-6170

Vermont

Department of Natural Resources, Solid Waste Division
103 South Main Street, Laundry Building
Waterbury, VT 05671-0407
(802) 244-7831

Virginia

Department of Waste Management
Division of Litter Control and Recycling
101 North 14 Street – 11th Floor
James Monroe Building
Richmond, VA 23219
(804) 371-0044

Washington

Department of Ecology Waste Reduction
Waste Reduction and Recycling
P.O. Box 47600
Olympia, WA 98504-7600
(206) 438-6257

Recycling and Litter Control
Mail-Stop PV77
Olympia, WA 98504
(206) 459-6257

West Virginia

Waste Management Division
Department of West Virginia Natural Resources
1900 Fanawa Blvd, Building 3, Room 732
Charleston, WV 20665
(304) 558-3370

Wisconsin

Department of Natural Resources
Bureau of Solid and Hazardous Waste Management
101 South Webster Street
Madison, WI 53707-7921
(608) 267-7566

Wyoming

Department of Environmental Quality
122 West 25th Street
Herschler Building, 4th Floor
Cheyenne, WY 82002
(307) 777-7752

State Recycling Associations (private and/or nonprofit)

Alaska Recyclers Association
5650 Camelot Drive
Anchorage, AK 99508

California Resource Recovery Centers
125 West Swift Avenue
Clovis, CA 93612

Illinois Association of Recycling Centers
P.O. Box 2603
Naperville, IL 60565
(217) 351-4584

Indiana Institute on Recycling
Room 921, School of Education
Indiana State University
Terre Haute, IN 47809
(812) 237-3000

Indiana Recycling Coalition, Inc.
P.O. Box 20444
Indianapolis, IN 46220
(317) 283-6226

Michigan Recycling Coalition
P.O. Box 482-107
Ann Arbor, MI 48107
(313) 665-6398

Recycling Association of Minnesota
P.O. Box 30632
St. Paul, MN 55175

Nebraska State Recycling Association
R R 2, Box 423
Kearny, NE 68847
(308) 237-7339

New Hampshire Resource Recovery Association
P.O. Box 472
Concord, NH 03301
(603) 224-6996

Association of New Jersey Recyclers
P.O. Box 625
Abescon, NJ 08201
(201) 641-8292

Cornell Waste Management Institute
Center for Environmental Research
468 Hollister Hall
Ithica, NY 14853-3501
(607) 255-7535

Federation of Ohio Recyclers
2801 Far Hills Avenue
Dayton, OH 45419
(513) 294-8080

Association of Oregon Recyclers
P.O. Box 10051
Portland, OR 97210
(503) 227-1319

Pennsylvania Resources Council
44 East Front Street
Media, PA 19063
(215) 656-9131

Association of Vermont Recyclers
P.O. Box 965
Rutland, VT 05701
(802) 775-6482

Washington State Recycling Association
P.O. Box 569
Seattle, WA 98111
(206) 363-8433

Wisconsin Coalition for Recycling
111 King Street, Room 31-32
Madison, WI 53703
(608) 256-0565

Trade Associations of Recycling Industries

Aluminum Recycling Association
1000 16th Street, Northwest
Suite 603
Washington, DC 20036
(202) 785-0550

American Iron and Steel Institute
1000 16th Street, Northwest
Washington, DC 20036
(202) 452-7100

American Paper Institute
260 Madison Avenue
New York, NY 10016
(212) 340-0600

Association of Petroleum Refiners
P.O. Box 427
Buffalo, NY 14205
(716) 855-2212

Automotive Dismantlers and Recyclers Education Foundation
1133 15th Street, Northwest
Washington, DC 20005
(202) 293-2372

Can Manufacturers Institute
1625 Massachusetts Avenue, Northwest
Washington, DC 20036
(202) 232-4677

Glass Packaging Institute
1801 K Street, Northwest
Suite 1105-L
Washington, DC 20006
(202) 887-4850

Institute of Scrap Recycling Industries, Inc.
1627 K Street, Northwest
Suite 700
Washington, DC 20006
(202) 466-4050

National Tire Dealers and Retreaders Association
1250 I Street, Northwest
Washington, DC 20005
(202) 789-2300

Paperboard Packaging Council
1101 Vermont Avenue, Northwest
Suite 411
Washington, DC 20005
(202) 289-4100

Rubber Manufacturers Association
1400 K Street, Northwest
Washington, DC 20005
(202) 682-1338

Society of the Plastics Industry
1275 K Street, Northwest
Suite 400
Washington, DC 20005
(202) 371-5200

Technical Association of Pulp and Paper Industries
P.O. Box 105113
Atlanta, GA 30348
(404) 446-1400

Textile Fibers and By-Products Association
P.O. Box 11065
Charlotte, NC 28220
(704) 527-5593

Tire Retread Information Bureau
26555 Carmel Rancho Boulevard
Suite 3
Carmel, CA 93923
(408) 625-3247

Wellman, Inc.
Dennis Sabourin, Vice President
1040 Broad Street, Suite 302
Shrewsbury, NJ 07702
(201) 542-7300

Appendix F — Bulletin Board Ideas

Assign a letter to each child and have him bring in an object or a picture from a magazine that has the same beginning sound. Each item can be placed on the board by the appropriate alphabet letter. Students can record their own inventories of objects in a notebook.

A – aluminum foil
B – book
C – can
D – diaper
E – envelope
F – filter
G – glass
H – house
I – instrument
J – junk
K – kitchen appliances
L – lock
M – machine
N – newspaper
O – office supplies
P – paper
Q – quilt
R – roller skate
S – scarf
T – tree
U – uniform
V – vault
W – water
X – X-ray
Y – yarn
Z – zinc

Use this bulletin board to emphasize how much trash can build up in four weeks. Have students pin their trash to the board each day. Use this display to discuss where trash goes. How does recycling help? How does separating items help? How can we reduce our own trash each day?

Here's the perfect bulletin board for encouraging your students to use biodegradable items. From disposable diapers to plastic bags to styrofoam fast food containers, have students bring in items that can be pinned to the board to illustrate the point.

Brainstorm with your class and discuss ways to counteract the use of these items.

- Students could petition a fast food chain to use only recycled containers.
- Students could write articles about the positive use of cloth diapers.
- Ask students to list creative uses for old containers (i.e., birdhouse from milk carton).
- Challenge students to create gifts from throwaways. What ideas do they come up with?
- Can they think of three uses for each of the following: plastic egg cartons, bottle caps, plastic bags from newspapers?

Use this bulletin board to demonstrate to students how wasteful and misleading the packages that items come in can be. Before winter vacation, ask students to keep the boxes and packages they receive that are overly large, wasteful, or misleading. Be sure to send a note home to parents, so they won't mind keeping trash. Attach these items, as well as pictures from magazines and catalogues of overwrapped items, to the bulletin board. After discussing the problems about overpackaging, have students write to a toy company or food packager about how their package could be changed to be more efficient and less wasteful or damaging to the environment.

This bulletin board may also be used in December for exchanging students' toys. Each student can bring in an item under $2 that he or she wants to swap. Add actual items or pictures to the bulletin board and let students trade their items for others. Students can choose numbers to see who goes first!

Ask students to bring in samples of junk mail their families receive in the mail. Cover the bulletin board with the collection. Talk about types of categories which might include coupons, advertisements, catalogs, requests from charities, etc. To whom is the mail addressed? Is it addressed to "occupant" or by name? Talk about the types of pieces brought in. Does everyone agree on what is junk mail?

How would you classify the following examples? Are they junk mail?

A letter from a friend ____________________
An ad for groceries ____________________
A sample box of cereal ____________________
A bill ____________________
An announcement ____________________
A newspaper ____________________
The neighborhood newsletter ____________________
Coupons from stores in the neighborhood ____________________
A flyer from someone willing to mow lawns ____________________

Can you explain going to the beach and not being able to swim? That is what has happened to many children along the eastern seaboard. They have found bags filled with medical debris, hypodermics, used waste, medications, etc., floating to shore. Industrial factories have also poured their waste into the rivers for years. Write a letter to your state congressman or senator, the president or chairman of the board of an industry about your environment concerns. Write a letter to a foreign correspondent contact about environmental concerns in their area. Post the responses on a separate bulletin board.

Encourage students to collect trash that they find around the school and at home. Make sure there are no sharp edges or rusty cans. Concentrate on paper and plastic. Direct students to post one piece of trash to the bulletin board. When the board is covered, award each student with the badge of honor.

Use this bulletin board to encourage students to write their feelings in the form of poems. Display the poems on the bulletin board. Here are some possible titles for the poems.

I Love the Earth
Litter Loser
Cash for Trash
Ready, Set, Recycle
I Can Help

Earthlings, Listen
Go, Go, Garbage
Going, Going, Gone
Energy Energize

Encourage students awareness of waste output. Direct each student to decorate a brown paper lunch bag with crayons and markers. Put the bags on the boards and challenge students to not fill them.

Hold that can! What can be used instead of cans? Instruct students to cut out pictures of can substitutes. As a class project, construct a bulletin board display.

Save that foil. Have students save cleaned aluminum foil for one month. Use the foil in an art activity during the month of October. Have students shape the foil into spooky Halloween creatures like bats and ghosts. Add the finished products to the bulletin board.

Here's a great bulletin board to use in April to emphasize recycling. Duplicate a rabbit for each student and add his name. Students could glue a cotton ball on their rabbit each time they recycle.

If you have an idea for a bulletin board in the revised edition, please send your ideas to:

Marty Alenduff, Project Director
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798

HO, HO, HO!

Sending Christmas cards this year? Buy cards made of recycled paper. You'll send an Earth-saving message along with your holiday greeting . . . and save some trees.

SEASON'S GREETINGS

Save, collect, and reuse last year's Christmas cards.

ATTENTION SHOPPERS:

No shopping days left 'til Christmas. If you have not found the "perfect gift" yet, how about giving a nonmaterial gift like a homemade coupon for a backrub or an hour of free babysitting? It's nonpolluting, nonwasteful, and a personal gift.

SLEIGHBELLS RING

Shopping for a tree? How about buying a live Christmas tree that you can plant after the holidays and enjoy for years to come? That way, one less tree will be cut down.

WRAPPING THINGS UP

When it's time to wrap Christmas gifts, try using a few pages of the Sunday funnies instead of fancy store-bought wrapping paper – especially on gifts for children. It's a lot of fun, and of course, it's 100 percent recyclable! Look for wrapping paper that's made from recycled materials, too.

STILL WRAPPING THINGS UP

Now that your Christmas gift shopping is all done and you've just finished wrapping, plan to save the bows and ribbons after the gift-opening spree on Christmas morning. That way, on gift-wrapping night next year, you can reuse and help use fewer resources.

EDIBLE ORNAMENTS

When you decorate your trees, use strings of popcorn for ornaments. After the holidays, when you take the tree down, take the popcorn outside and feed it to the birds! You'll be returning what you use to the Earth, and giving a special little gift at the same time.

If you have other holiday recycling activities for the revised edition, please send these activities to:

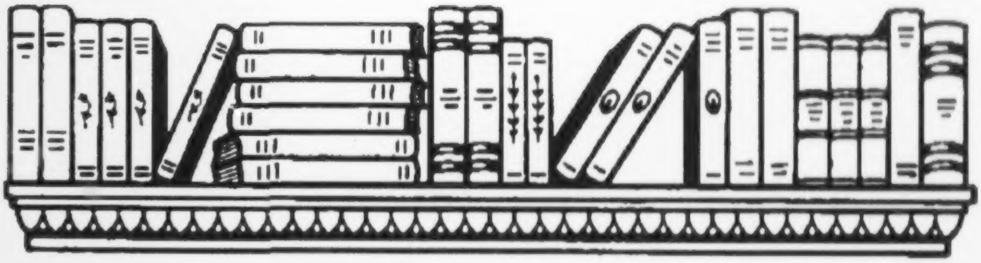
Marty Alenduff, Project Director
Center for School Improvement and Performance
School Assistance Unit
Room 229, State House
Indianapolis, IN 46204-2798

Appendix H Eco-Books for Children

Recommended Reading:

You don't have to be a grown-up to help save the earth. Among the fine eco-books for children:

- *50 Simple Things Kids Can Do to Save the Earth* by the Earthworks Group (Andrew and McNeel)
- *Beatly Neighbors* by Mollie Rights (Little, Brown & Company)
- *The Kid's Nature Books* by Susan Milford (Williamson Publishing)
- *2 Minutes a Day for a Greener Planet* by Marjorie Lamb (Harper and Row)
- *Resource Recycling* 1206 Northwest 21 Street, Portland, OR 97210
- *Ecotopia* by Ernest Callenbach (Bantam Books)
- *The Lorax* by Dr. Seuss (Random House, 1971)
- *The Wump World* by Bill Peet (Houghton Mifflin, 1970)
- *The Green Book* by Jill Pation Walsh (Farrar, 1982)
- *The Sierra Club Summer Book* by Linda Allison (Seirra Club Books)



- *Earth Book for Kids – Activities to Help Heal the Environment* by Linda Schwartz (Learning Works, Inc. 1990)
- *The Giving Tree* by Shel Silverstein (Harper and Row 1964)
- *The Motel of Mysteries* by David McCauley
- *What on Earth You Can Do With Kids: Environmental Activities for Every Day of the School Year* by Robyn Freedman Spizman and Marianne Daniels Garber, Ph.D. 1991
- *Ecology: A Thematic Unit* (Teacher Created Materials, Inc.) Huntington Beach, CA 1991
- *Protecting Our Planet* by Ava Deutsch Drutman and Susan Lam Zuckerman 1991 (Good Apple Publishing – Carthage, Illinois)
- *The Ocean Book* by Center for Marine Conservation (John Wiley and Sons)
- *Keepers of the Earth* by Micheal Caudato and Joseph Bruchac 1988
- *50 Simple Things Kids Can Do To Save the Earth* by Andrews and McMeel 1990
- *50 Simple Things You Can Do To Save the Earth* by Earth Work Press 1989
- *Embracing the Earth: Choices for Environmentally Sound Living* by D. Mark Harris 1990 (Noble Press, Inc.)
- *Heloise, Hints for a Healthy Planet* by Heloise 1990 (Putnam)
- *Facts on Domestic Waste and Industrial Pollutants* by Hugh Johnstone (Franklin Watts, 1990)
- *The View from the Oak* by Judith Kohl and Herbert Kohl (Little, Brown, and Co. 1977)
- *Ecology* by Richard Sprugeon (Osborne Publishing 1988)
- *Trash* by Charlotte Wilcox (Walker 1988)

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Inquiries regarding compliance with Title IX may be directed to the Human Resources Director, Indiana Department of Education, Room 229, State House, Indianapolis, IN 46204-2798, or to the Director of the Office of Civil Rights, Department of Health and Human Services, Washington, DC; **Dr. Suellen Reed, State Superintendent of Public Instruction.**

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